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No. XIV. OF VOL. I., 1926. LONDON, SATURDAY, APRIL 3, 1926. Pp. 112—Price 1s.
No. 5353. Vol. CCX. Founded 1823. Registered as a Newspaper. Published Weekly. Annual Subscription Inland £2 2s. Abroad £2 10s.

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MODERN TECHNIQUE IN TREATMENT

IN response to a very widely-expressed desire on the part of readers of THE LANCET, it has been decided to continue the issue in permanent form of the Articles which appear weekly in the Journal under the general title of MODERN TECHNIQUE IN TREATMENT.

It will be seen from the List of Contents of Volume 2 that a very wide range of subjects comes under treatment; but all the Articles agree in being written from an entirely practical point of view, and it may therefore be said that every one will be found of interest and value to the general practitioner who wishes to keep abreast of modern ideas and methods.

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Lumleian Lectures
ON
ENDOCARDITIS.

The First Lumleian Lecture in 1926, delivered before the Royal College of Physicians of London on March 23rd,

BY SIR THOMAS HORDER, BART., K.C.V.O.,
M.D., F.R.C.P. LOND.,
PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL.

MR. PRESIDENT, FELLOWS, AND GENTLEMEN,—My first and pleasing duty is to thank you, Sir, and the Censors of the College, for the honour of my appointment to the post of Lumleian lecturer. The gratification which I feel is tempered by humility when I recollect the long line of distinguished Fellows who have held this lectureship, a line which includes the illustrious name of Harvey. A man of my temperament must needs be appalled by such knowledge, and though my mind is thrilled by the thought that the subject which I have chosen for these lectures is not distantly related to matters which the greatest of our Fellows illumined by the light of his genius, I tremble at another thought—my incapacity to prove myself worthy of your choice. Indeed, I am ready to acknowledge that at the close of these lectures even the most generous of my hearers may find it a difficult task to credit me with casting a glimmer into the darkness that hides so much of the subject-matter with which I propose to deal. I shall be satisfied if a few of my audience, still generously disposed, may feel helped by reconsideration of old facts, by a frank effort to discriminate between what we do, and what we do not, know, and by the exercise of some care in suggesting how the present gaps in our knowledge may perhaps be filled, whether by clinical observations or by laboratory research. I shall resist the vanity of trying to say all that can be said on so large a subject, rather contenting myself by selecting certain features which overlap with my personal experience and reflections.

It may be advanced that in these days, when more exact knowledge of the inflammatory changes taking place in the heart as the result of rheumatic infection has led us to the realisation that the lesion produced is a pancarditis rather than an endo- peri- or myocarditis, the subject of endocarditis has become one of secondary importance. But given this concept of the effect of the rheumatic virus upon the heart, there has arisen, pari passu with its recognition, a growing interest in another type of heart infection in which, as is generally admitted, the brunt of the invasion and of the interaction between the infecting agent and the tissues certainly comes upon the endocardium. I refer to that group of infections which is for the nonce termed "bacterial." Of the growing importance of this type of endocarditis, which, but for the objection of adding one more name to a nomenclature already overburdened, might justly be called in contra-distinction to the rheumatic type "endocarditis vera," we are all fully aware. I shall ask no indulgence for making it the main purpose of these lectures, nor for bearing it constantly in mind when dealing with other types of endocarditis, with one and all of which it has important relations.

I know of no classification of cases of endocarditis which is scientific and therefore none that is helpful. Nor do I propose to offer one. If it be true that to have overcome the desire to classify is to have attained a little wisdom, then, in this matter, I have attained a little. A mere recital of the known infecting agents causing a morbid condition is not a classification, and in the case of endocarditis such a recital must perforce at present find the cause of the majority of cases lacking. I propose to proceed without a classification. I shall deal first with endocarditis as it results from rheumatic and syphilitic infection. I shall then consider the influence upon the endocardium of certain factors which are not, so far as we can judge, microbic. I shall follow this by a statement of our present knowledge of so-called bacterial infections, and I shall conclude by considerations of pathogenesis, prognosis, and treatment.

RHEUMATIC ENDOCARDITIS.

It was in the course of his Lumleian lectures in the year 1894 that Sturges preached the doctrine of rheumatic carditis. Sturges's subject was Heart Inflammation in Children, and he laid emphasis upon the fact that rheumatic heart affections in children were almost always both endocardial and pericardial. Although he noted the frequency with which the myocardium was also involved, he thought this occurred as the result of the pericardium having become adherent, This idea was probably a survival of the teaching current before this time and indeed still prevalent at the time of Sturges's lectures. In Fagge and Pye-Smith's excellent text-book, in the edition appearing three years prior to Sturges's reference, occur the words, "There is no true carditis as there is no true inflammation of the brain. The inflammations of the heart do not directly concern the muscle, but the covering and the lining membranes." When this was written careful histological examination of the myocardium in rheumatism had not been undertaken and, I might add, encephalitis was not prevalent.

It is significant of the slowness with which ideas, however lucidly stated, and however logically supported, gain permanent and practical acceptance in medicine, that the doctrine so ably advanced by Sturges 32 years ago still requires, and receives, reiteration to-day. The growing conviction of clinicians that the heart was seriously involved as a whole, and from the first, in most severe cases of acute rheumatism, coincided with more critical investigation into the state of the heart wall in fatal cases; the discovery by Aschoff of the nodes which bear his name, and the confirmation of these and other changes by many histologists, put this conception of the unity of the cardiac inflammation in this disease upon a firm basis.

Norman Moore, the Lumleian lecturer in 1909, when treating of Rheumatic Fever and Valvular Disease, advanced the view that the endocarditis of acute rheumatism was the "central condition in the disease." According to Norman Moore, "endocarditis is always present" in acute rheumatism. "The conclusion to which I wish to attain," he says, "is that every case of rheumatic fever, whether the pains in the joints are slight or severe, is a case of endocarditis, and that the condition of the endocardium is not to be regarded as a frequent complication, but as the essential and invariable feature of the disease." Again, "If no evidence of endocarditis is to be found throughout an illness of which a symptom is arthritic pain, then that illness is not rheumatic fever, and the arthritis has some other cause." According to the view the various peripheral expressions of the rheumatic infection, such as arthritis, the cerebral symptoms, the lesions in the skin and subacute tissues, &c., are secondary to the heart affection. Whether he considered the mechanism by which these peripheral symptoms arose to be by a process of embolism or no Norman Moore did not say, but quite recently Krogins has taken this view, considering the symptoms in both acute rheumatism and in gonorrhœal rheumatism to be metastatic in nature. The alternative conception, of a virus which invades the blood stream and exercises a special affinity for heart muscle, serous membranes, subcutaneous tissues, skin, and certain parts of the brain, so that more or fewer of these structures are involved structurally and functionally at the same time seems rather more probable in the case of acute rheumatism.

Be the mechanism of the infection what it may, we have become satisfied concerning two points in

relation to heart affections incident upon acute rheumatism: (1) That there is involvement of the heart in so great a proportion of the cases that it is wise to assume that it may be involved in all, and this even in the absence of any direct evidence by physical signs. (2) That the inflammation, especially in children, is of the nature of a carditis.

The Clinical Picture.

Carey Coombs complains that the subject of rheumatic heart disease is still divided up in even the most recent text-books under all sorts of headings and is therefore only dealt with "in scraps" rather than as an entity, possessing a specific cause and presenting a clear clinical and pathological picture. This complaint seems reasonable and the great importance of the matter justifies the strenuous and repeated efforts of this author, as also those of Poynton, an earlier worker along similar lines, to get recognition of the facts as we now know them.

Of the other relations existing between acute rheumatism and endocarditis there is little or nothing to add to the facts as established many years ago. It is a little humiliating, for example, to read again the conclusions drawn by Church just 40 years ago from his examination of 700 cases of the disease, an analysis which is still quoted in the manuals. True, his estimate that only one half of the patients affected had some heart affection in their first attack has been considered too low, as seen by my reference to the views of his colleague Norman Moore, but Church's other conclusions have received confirmation down to the present day. For example, he said that the heart, when affected, is usually implicated during the first week of the attack; that the liability to cardiac involvement diminished with age; that no system of treatment, whether by drugs or otherwise, had, until then, been shown to influence the tendency to endocarditis in acute rheumatism; that relief from pain and fever occurred four or five days sooner in patients treated by salicylates than in those not so treated. It is doubtful if an analysis of the last 700 consecutive cases of acute rheumatism at the same hospital would lead to any different conclusions. Some things, however, which mere statistics could not show, would, I think, strike the thoughtful investigator if he took trouble to study individual records rather than merely to catalogue the main results. There seems little doubt that cases of severe acute endocarditis during the first attack of the disease are less common than formerly. Further, and perhaps explaining the fact, rheumatic fever in the severe form which was so common even 25 years ago, is not at all a common disease to-day. Is it not rather uncommon to see a young man, either in hospital or in private practice, presenting the picture of severe rheumatic fever? Yet such cases were an almost daily experience a generation ago. The hyperpyrexial form of the disease, and cases in which cerebral symptoms were a striking feature, seem entirely to have disappeared. Church, in the analysis just quoted, refers to the fact that already both pericarditis and lung complications had even at that time become much less frequent, and he adds with caution that it remained to be proved whether this was due to salicylate treatment or to other causes. After 40 years I fear that we must add that we still do not know. May it not have been even then due to some change in the interaction between the virus and the tissues resulting from a change in the virulence of the infecting agent? Or to some change in the resistance of the tissues infected? And may not the continued tendency, since Church's analysis was made, for pericarditis, and especially pericarditis with liquid effusion, to become less common, together with the lessened severity of the cases of acute endocarditis, and of rheumatic fever generally, be expressions of one or both of these same changes?

Following the line of thought introduced by Swift, who refers to two distinct types of response on the part of the tissues to infection by rheumatic fever—the proliferative and the exudative—we should say that the facts just mentioned suggest that exudative changes have become less common, whereas proliferative changes have remained as frequent as before, or have perhaps tended to increase in frequency. I shall refer again later to the relative infrequency of a first attack of acute rheumatic endocarditis in young adults. The possibility of a more complete resolution taking place in a valvulitis at this age, provided no further infection takes place, then in children, in whom the valve cusps are exceedingly thin and delicate, must not be overlooked.

But with this change in the character of the disease we call acute rheumatism or rheumatic fever, so that its more severe forms, and the coincident forms of acute endocarditis and pericardial effusion, have become much less common, there has probably occurred an increased frequency of the subacute and chronic forms of the infection, together with subacute and chronic endocarditis. I have not the benefit of a large experience at a children's hospital, yet I gather that this statement applies equally to children as to adults. It is constantly treated by those who see many ill children that rheumatic heart disease frequently arises in the absence of arthritic signs or indeed of any signs other than those indicative of the carditis. Although this fact was well known to physicians 40 years ago, the number of cases of rheumatic heart disease found in children who present no other feature seems now to bear a larger percentage to the whole than formerly.

Types of Resultant Lesions.

Let me turn now to a consideration of the types of endocardial lesions which result from rheumatic infection, whether acute, subacute, or chronic. In the first place let me trace the course of a mitral endocarditis set up during an attack of rheumatic fever as closely as the known facts will allow. Since we must regard the inflammation as being essentially a valvulitis, a point emphasised by Swift in his recent studies, it is difficult to see how complete resolution can take place in so delicate a structure once it has been inflamed in the particular manner we know to be characteristic of rheumatism. It is probable, therefore, that few, if any, cases escape some degree of resultant injury. It is also probable that the conservative estimates of the earlier observers, such as Church, relative to the frequency of involvement of the heart valves in rheumatism, and also to the proportion of complete recoveries, is explained by the fact that the estimates were made at too short a period of observation after the attack. It was known that the systolic bruit, so frequently present during the attack, not infrequently disappeared for a time and then reappeared, but it is likely that many cases, and especially hospital cases, upon which almost entirely statistics are based, were registered as being free from valve mischief during this very interval when there were no signs of heart disease. Kemp, as the result of a careful analysis of cases of acute rheumatism in Radcliffe Infirmary, concludes that these older estimates of the incidence of heart affections and of subsequent damage were correct. He also concludes that much that was termed endocarditis in acute rheumatism was really myocarditis, and largely recoverable.

What were the recognised results of the valvulitis caused by acute rheumatism other than the hypothetical recoveries? They were three: (1) Cicatrisation takes place, leaving the valve cusps deformed and shrunken, but eventually settling down into permanent shape and remaining so for a long time, it may be many years, until some other factors come into play to disturb the compensating mechanism in the heart. To this condition the term "mitral incompetence" was given. (2) Further and frequent attacks of rheumatic infection may enhance the damage and increase the valvular defect. The resultant state of the mitral orifice imposes more difficulty upon the circulation, embarrassed further by associated changes in the mural endocardium, in the myocardium, and perhaps also in the pericardium, attendant

upon the repeated invasions of the virus. The net result of this recurring type of acute rheumatism was the production of what was termed "double mitral disease." (3) The third alternative sequel was the gradual, or rarely the rapid, transition of the case into one of the ulcerating type of endocarditis. Of this sequence more anon.

Valvular Incompetence or Stenosis?

What was the recognised result upon the mitral valve of rheumatic infection with more insidious and more chronic symptoms—"growing pains," mild chorea, myalgias, and various fibrositic manifestations? Although it was believed that any of the cases in this group might develop mitral incompetence with or without stenosis, there was a general belief that the net result was likely to be the production of mitral stenosis, with little or no regurgitation. I speak here of tendencies and of average results merely, not of absolute or universal findings. The more purely regurgitant a mitral lesion was found to be the more likely was it that the patient had had an acute attack of rheumatism and one attack only, or, if more than one attack, then with intervals of some years between the attacks. The more purely stenotic the mitral lesion was found to be, the more likely was it that the patient had never had an attack of acute rheumatism, but had had some mild rheumatic manifestations of the chronic kind just mentioned, or gave no history of any rheumatism at all. Looked at from another angle, the type case of mitral incompetence was an adult man who had had a severe but single attack of acute rheumatism in his teens. The type case of double mitral disease was a child or young adult, who owed the defect to repeated attacks of rheumatism, largely subacute, and who had considerable myocardial damage in addition. The type case of mitral stenosis was a middle-aged woman who rarely gave a history of acute rheumatism, and often gave no history of rheumatism at all.

How do these views compare with current ideas as to the resultant valve changes following rheumatic infection? There has been of late years a tendency to consider mitral incompetence a very uncommon sequel to acute rheumatism; indeed, many cardiologists of the present day have discarded the term altogether, or use it only to signify patency of the mitral orifice resulting from cardiac dilatation, temporary or permanent. When faced with a patient who presents signs of what others would term cardiac hypertrophy with a blowing systolic bruit transmitted to the axilla and a diastolic interval free from both bruit and thrill, they explain the state of affairs by postulating a diseased myocardium and a dilated mitral ring. And when dilatation of the heart arrives in such a case they read this to be due to failure of the myocardium originally and permanently damaged by rheumatism rather than due to inability of the hypertrophied ventricle to compensate further for the regurgitation. Others wander still further from the old conception, and, feeling so certain that the end-result of rheumatic mitral valvulitis is more or less of mitral stenosis, they actually apply this latter term to cases presenting the signs just mentioned. So the apparent anomaly arises, that of two physicians who examine the same case, one will label it "mitral incompetence" and another "mitral stenosis." All this is much to the confusion of the student's mind. Without, as yet, the help of proper figures to guide me, I think it is true to say that post-mortem experience favours the view that mitral incompetence due to old rheumatic endocarditis is much less common than it formerly was.

A Paradox.

It is not so very important that such a paradox arises as it is that the circumstance denotes very definitely a changed conception in the rheumatic process. The change is far-reaching in its effect upon our attitude towards post-rheumatic hearts; it is only as yet partly reflected in the text-books and in the routine teaching of the schools. It is, I think, of more than academic interest to inquire if this change be due to more careful and more prolonged observations carried out upon hearts affected by rheumatism or to an actual change in the material observed. That our predecessors were not less skilled than we are with their hands and ears scarcely admits of doubt. And certainly they gave as much time to thought on all these matters. Moreover, be it noted, the particular point is not one upon which either X rays or instrumental methods have thrown much light. It is, however, possible that the opportunity for continued and prolonged observations upon large numbers of cases of heart disease has been greater during the post-war period.

I am as yet uncertain which of the two explanations I have offered for this change of attitude is the correct one, or whether it be each explanation in part. Auricular fibrillation has been the subject of so much attention of late years, and is so intimately bound up with heart failure in mitral stenosis, that there is possibly an added factor here in concentrating the mind upon this particular condition. Put briefly, the changed conception resolves itself into this—that very much of the life-history of the rheumatic heart may be expressed by the term "chronic rheumatic valvulitis." There certainly seems much reason in disallowing that the progressive sclerosis which goes on in the mitral cusps and adjacent endocardium, up to the production of the "buttonhole" mitral orifice, is merely a slow residual contraction after an initial injury. That some chronic and persistent irritant is still at work through long periods of time seems certain. But is that irritant the rheumatic virus?

"Pure Stenosis."

The occurrence of "pure mitral stenosis" in women who give no history of any illness prior to the development of cardiac symptoms has always been a puzzling fact. And remains so to-day. An analysis of the last 100 cases of pure mitral stenosis admitted to St. Bartholomew's Hospital shows that 76 were females and 24 were males. In 63 out of the 100 cases there was no history of acute rheumatism, and in 36 out of the 100 cases there was no history of rheumatism or of any allied condition. Of these 36 cases 27 were women and 9 were men. In a careful analysis of 50 cases of mitral stenosis in soldiers Cotton found a history of acute rheumatism in 22 only. French observers have considered that the condition is a congenital one—that is to say, that it begins as a congenital defect, and that this increases as time goes on. Dieulafoy, commenting upon the frequency of, and the unique features presented by, this form of valvular disease, says, "It is sometimes associated with congenital malformations" (but he does not cite instances of this). "It is independent of rheumatism and the other causes which usually give rise to endocarditis. This stenosis is associated sometimes with chlorosis." But we in Great Britain do not seem to have found this association any more than we have found Virchow's hypoplasia of the aorta in this connexion. There has been an effort made by other French observers to associate mitral stenosis with tuberculosis, not so much directly as indirectly, through tuberculous toxins. But this view, again, lacks confirmation. Poynton drew attention to the constancy with which renal sclerosis was found post mortem in association with these cases of advanced mitral stenosis, and it is interesting to reflect that it is in the same sex, and about the same age, that another mysterious sclerosing lesion appears in type form—namely, the so-called "contracting white kidney." Until we know more of the specific cause of rheumatism we do not seem likely to get nearer to the solution of the problem of this special form of mitral sclerosis. At present it is impossible either to assert or deny that these cases are the result of the specific action of the

rheumatic virus. The fact that the specific histological lesion of rheumatism is not found in them certainly must not be taken as excluding the possibility of their being rheumatic, for the chronicity of the process and the fibroid nature of the changes in the valve segments would, by analogy with other chronic infections, explain this fact. We do not (readily) find gummatous formations in parasyphilitic diseases, nor tubercles in fibroid types of tuberculosis. Moreover, it is not easy always to demonstrate Aschoff's nodes in some cases of carditis in which, on all other grounds, we have no reasonable doubt that the infection is rheumatic. Whatever the ætiology of mitral stenosis in its extreme form in adults may be, it seems certain that the proportionate incidence of chronic sclerosing endocarditis is greater than it formerly was. It is tempting to associate this fact with that other fact to which I have referred—the decline in the incidence of severe acute rheumatism and a relative increase in mild and recurring cases.

Of the endocarditis occurring in scarlet fever I will only say this—that there seems to be a proportionately greater tendency for aortic involvement than in the case of acute rheumatism, a point to which I shall refer again.

SYPHILITIC ENDOCARDITIS.

The affections of the endocardium due to syphilis are probably less difficult to define than in the case of rheumatism. We know that the part most often affected is that of the aortic cusps, and we also know that such affection is in most cases part of an aortitis. Syphilitic disease of the aortic cusps leaves these delicate structures fibrosed and contracted, leading to aortic incompetence and its various sequelæ. Rheumatism affects the mitral much more often than the aortic cusps, and probably affects the aortic cusps alone quite rarely. The converse is the case with syphilis. It is generally held that the mitral cusps are not affected at all by syphilis, but I have been struck by the not infrequent presence of a well-marked apical systolic bruit in cases of parasyphilitic disease of the central nervous system and in the absence of any history of rheumatism. The bruit has been musical in character in some cases, a feature which makes it unlikely that the murmur has been due to mere dilatation of the mitral ring. I am not here referring to cases in which aortic disease is present, and in which, therefore, there might be secondary changes at the mitral orifice.

We owe to Warthin a very complete investigation into the changes induced in the heart and aorta by syphilis. Warthin's studies make it clear that these changes are both diffuse and focal, and we cannot but be struck by the resemblance in many points between the mode of attack of syphilis and of rheumatism. In both infections there are produced proliferative lesions, largely perivascular in nature, with nodal structures which are recognisable histologically. There is some not distant resemblance between these nodal lesions in the two diseases, so that it is a little strange that the likeness between the Aschoff bodies in rheumatism and the small gummata in syphilis of the heart has not led obervers to consider if the virus of acute rheumatism may not be spirochætal in nature. Warthin and others have pointed out that the *Treponema pallidum* is sometimes demonstrated in large numbers in the myocardium, even when there are none to be found elsewhere in the body. So far as the endocardium is concerned, the typical lesion of syphilis is undoubtedly a mesaortitis affecting chiefly the base of the aorta, which includes the sinuses of Valsalva, the roots of the aortic cusps, and the part of the aorta just above these structures. No doubt in many instances the process includes a true aortic valvulitis. The disease is prone to be very latent, so that our evidence of its actual incidence, in terms of frequency, can only be assessed indirectly. The sources of this indirect evidence are three: (1) Patients occasionally come under observation with symptoms which render a diagnosis of syphilis of the aortic ring extremely probable, and they respond well to antisyphilitic treatment. I shall return to these later. (2) Aortic incompetence in men about the age of 40, who give no history of acute rheumatism or of any other infective process likely to cause endocarditis, and whose blood gives a positive complement-fixation test for syphilis, is quite common. We seem justified in regarding these cases as residual after old syphilitic disease of the aortic cusps, or, indeed, as being still the subjects of aortic syphilis. (3) In the post-mortem room we frequently come across undoubted evidence of syphilitic disease of this region of the aorta which has not been suspected during life. This may be because death has been sudden or because the actual damage to the aortic cusps has not been so severe or so prolonged as to lead to symptoms. The extreme latency which is so marked a feature in syphilitic disease of the aorta was strikingly illustrated in the case of a policeman admitted to St. Bartholomew's Hospital. His age was 32 years. His history was to the effect that whilst assisting a fellow constable to lift a corpse down a flight of stairs his companion, who went before, slipped on a step and fell. The patient, in order to save himself from falling also, leant back heavily, still holding on to the dead body. At the moment that he did this he felt a sharp pain in his chest and felt faint. He was assisted downstairs and to the open air, sat down, and soon felt better. However, he was sent home, and still feeling queer he went to bed. His wife, who was out at the time of his arrival, returned and brought him some tea. As he was taking this he saw his wife looking about the bedroom as though searching for something, and, on inquiring what it was, "I was looking for the cat," she replied. She then explained to him that she could hear the cat purring. However, no cat could be found, and the woman discovered, to her surprise, on approaching the bed more closely, that the purr proceeded from her husband's chest. The pain from which the patient at first suffered had gone completely in three or four days; he was kept in bed for ten days and then sent by ambulance to hospital. When seen, the bruit was still very loud and could be heard distinctly by leaning over the bed, it being not necessary for the observer's head to touch the chest wall. The murmur was highly musical in character and was diastolic in time. There was no evidence of cardiac hypertrophy, but there were the usual arterial signs of aortic regurgitation. A fairly marked anæmia was present and a "triple plus" Wassermann reaction. There was a history of syphilitic infection ten years previously. The patient improved rapidly under treatment by potassium iodide and mercury and left the hospital well but with the signs of aortic regurgitation. There can scarcely be much doubt that this was a case of rupture of an aortic cusp already the site of a syphilitic valvulitis.

Diagnosis.

All this indirect evidence, taken together, makes it certain that syphilitic aortitis, with aortic valvulitis, is a not uncommon disease. It is obviously very important that we should bear this fact in mind in our practice and be prepared to suspect the disease, even though, as I shall now proceed to show, our means of diagnosing it with certainty are slender. If we wait until gross structural changes are produced in the aortic cusps we wait too long. It is to be doubted whether, in syphilis, as in acute rheumatism, complete resolution can ever take place once valvulitis has been present. But by checking, or by stopping altogether, the process of active infiltration and proliferation in the valve cusps we can lessen the residual damage in these structures, and thus prolong considerably the period of relative cardiac sufficiency which every case of aortic incompetence can only at best enjoy. No doubt a part of this increased freedom from undesirable sequelæ is due here, as it is in rheumatism in similar circumstances, to the fact

that the myocardium has been protected from gross damage.

An important question arises: At about what interval after the primary infection does syphilitic disease of the aorta begin? At about what age shall we begin to consider the possible presence of the disease? In treating quite recently of a series of cases of cardiac syphilis, Carey Coombs computes that the period between infection and the onset of the symptoms was over 20 years; he gives the average age of his patients as 53. Coombs does not distinguish between the cases showing evidence of aortic disease and those whose main defect happened to be myocardial, and it may perhaps be assumed that such distinction would have affected these figures. As the result of a still larger number of cases studied by him, Strickland Goodall has recently put the period elapsing between the primary infection and the appearance of symptoms even higher than this. Although I am unable to give statistics, I am led to the view from my own experience that these figures give no true expression of the early cases of the disease. It is notoriously difficult to differentiate between the fibrotic residues of old inflammation and the lesions of still active disease; no more common problem arises in the post-mortem room than the proper interpretation of the changes frequently seen in the aorta. And no less difficulty arises in regard to the interpretation of symptoms during life: are they due to active disease or to atheromatous changes in the production of which syphilis is only one causative factor? If we follow the view that smouldering infection still remains in all cases in which there is to be obtained a positive complement-fixation test this makes it more, and not less, likely that the first invasion of the tissues by the *Treponema pallidum* takes place much earlier than signs or even symptoms show themselves.

Is it not probable that the known facts in regard to that other distinctive and equally common syphilitic arterial disease, cerebral arteritis, give us some guide in this connexion? Unless we have some reasons for taking a different view, it is at least likely that the time of incidence in the course of syphilis of arteritis in the branches of the circle of Willis approximates to the time of incidence of syphilis of the aorta and the aortic cusps. And the former we have fairly good evidence for placing at from five to ten years after the primary infection. The difference in the age-incidence, when calculated from a large series of cases, would be explained by the fact that syphilis of the cerebral arteries can scarcely remain long without symptoms, whereas syphilis of the aorta can and frequently does. Perhaps this matter may be stated most clearly by postulating two somewhat different types of lesion produced by syphilis in the aorta, as there are two somewhat different types of lesion in the central nervous system. There is an earlier lesion of the gummatous kind, largely proliferative in character, and possessed of focal lesions in a high degree, and a later type of lesion, largely fibrotic in its features, to which the term "parasyphilitic" may not be inappropriately applied. If this conception be admissible then the apparent discrepancy to which I have referred would be explained. So also would be explained, and rendered again analogous, the known lack of effective response to antisyphilitic treatment in cases of syphilitic aortitis when once the signs of aortic incompetence are present. No doubt both types of lesion may be present at the same time, a fact which accounts in part for the great difficulty often experienced in the interpretation of post-mortem findings. If this view be substantially correct, it becomes a still more urgent matter to track down the early cases by all means in our power. We must look for these cases in men (by preference) who are between the ages of 25 and 40.

Symptoms and Physical Signs.

The main, and in perhaps most of the cases the only, symptom is pain, anginoid in character, situated in the region of the sternum, rather than in the region of the precordium, with a zone of reference or spread less extensive than is usual in angina pectoris. The pain is usually induced by, or increased with, effort, but this feature is not constant. Shortness of breath and the effort syndrome are sometimes present, but when this is so it is probable, from our general knowledge of these symptoms, that there is myocardial disease in addition to, or rather than, aortitis. There may be complaint of more general symptoms, such as slackness and vague dyspeptic symptoms, and the patient may be anæmic. But since these latter symptoms are common to so many diseases, it remains that it is the pain, and the pain alone, which arouses our suspicions in most of the cases.

As regards physical signs, these are absent or are equivocal. Lack of clearness in the aortic second sound, whether directly over the valve or at any point where the aortic second sound is listened to critically—and this should include the region just above the xiphisternum—is very suspicious. A ringing character to this sound, in the absence of high arterial tension, is perhaps equally significant. More change than one of these—to wit, a definite diastolic bruit—probably means that the valvulitis is not early and that resolution will not occur completely with treatment. I have only once, in a case of syphilitic aortitis, heard a definite diastolic bruit which disappeared with antisyphilitic treatment. It returned some two years later, despite continued treatment, and the patient then developed the arterial signs of aortic regurgitation. It is to be inferred that the disease was not detected at a sufficiently early stage to avert cicatricial changes. It is perhaps doubtful if we could ever completely avert some degree of cicatricial changes if a syphilitic valvulitis were once established, any more than we can in a rheumatic valvulitis, even though our means of treatment are much more "specific." The disappearance of the bruit and its reappearance later in permanent fashion is very reminiscent of what we know to happen not infrequently in the case of rheumatic fever.

I have never satisfied myself that the disease in its curable stage yields demonstrable dilatation of the aorta by physical signs. Nor have I ever got this evidence from X ray examination, though I understand that Price has met with a different experience. Our French colleagues construct a more elaborate picture of the signs and symptoms of early degrees of aortitis, but I find it difficult to follow them in actual practice. I doubt if at present we can go further than to say that a man below the age of 50, whose arterial tension is not raised, whose blood gives a positive complement fixation for syphilis, and who complains of pain that may reasonably be attributed to the aorta is probably suffering from syphilitic disease of this structure. If his age be under 40, the diagnosis is less uncertain. Treatment should be carried out promptly and thoroughly, and, since it is held strongly by some high authorities that active syphilitic infection should be presumed so long as the complement-fixation test remains positive, here, at least, this doctrine should determine our action, since there is so much to gain if it be true, and so little to lose if it be false. The important points are these: first, that it may be possible to detect and to treat syphilitic aortitis before as yet the aortic cusps are involved; and, secondly, that if it be detected and treated whilst as yet the degree of valvulitis is slight, the resultant valve damage may be so little and so unprogressive as not to prejudice the patient for an indefinite number of years.

INFLUENCE OF CONGENITAL DEFECTS.

I pass now to consider certain ætiological factors in the production of endocarditis, both of the valve cusps and of the chambers of the heart, which, though the exclusion of a chronic infective element must only be presumed at any time with great caution, appear to be outside the sphere of microbic activity. Having spoken of the possibility of

congenital defects in connexion with some cases of pure mitral stenosis I will take these first. It has been for a long time held that congenital defects in the heart are almost confined to the right side of this organ. Such defects as are found in the left side, if we except these gross defects which lead to such massive disturbances of the circulation that there are early and lethal results, have been too lightly passed over. There is good reason to believe that we have been too cavalier in our observations concerning the intimate anatomy of the heart valves, and of the aortic valve in particular, in relation to endocardial disease. Deviations from the normal in these delicate structures may well prove to be a determining factor in infection of a grade hitherto unsuspected. This possibility did not escape the eyes of older observers. Thayer reminds us that the recognition of the fact that bicuspid aortic and pulmonary valves predisposes to disease is as old as Paget. Osler also pointed out the liability of these malformed segments to sclerotic endocarditis. Of 17 cases examined by him, all presented sclerotic changes and the majority of them had, during life, the clinical features of incompetence.

Glynn, who gave the Lumleian lectures upon Infective Endocarditis in the year 1903, refers in detail to a specimen obtained from a man aged 18 years, in which one of the two cusps was found to be torn and everted and whose fatal illness started after a strain, during which it is presumed that the diseased cusp was damaged. I pointed out in 1909 that congenital defects that were compatible with good health and were outside the category of those grosser lesions which were to be recognised during life might still be of great importance in inducing active endocarditis. I cited cases of this as illustrated by defective interventricular septum and patent ductus arteriosus in patients of 31 and 42 years of age respectively. I drew special attention to the association of bicuspid aortic valves with bacterial endocarditis in 1905 when publishing the first case of endocarditis due to Pfeiffer's bacillus. In 1909 I dealt with this point more fully, having found bicuspid aortic valves in two other hearts in the museum of St. Bartholomew's Hospital, each the site of bacterial endocarditis. In still a fourth specimen, from a case of pneumococcal endocarditis, the pulmonary valve cusps were only two in number. Since that date four other hearts have been added to the museum, all showing bicuspid aortic valves, and all affected by bacterial endocarditis. In addition, Dr. T. H. G. Shore, the curator, possesses three unmounted specimens of a similar kind which he obtained from soldiers dying of this disease in France. It is very clear that the condition here dealt with is one of considerable importance.

In 1923 Lewis and Grant contributed a valuable paper to *Heart*, in which they treated of the normal structure of the aortic valve and especially of the relations of the aortic media to the annulus fibrosus. They describe in detail four cases of the condition of bicuspid aortic valve and seven further cases associated with bacterial endocarditis. There follows an analysis of 106 cases collected from the literature. Of these, 63 were males, 20 females, and in 23 cases the sex was not stated. These authors estimate that no fewer than 23 per cent. of males reaching adult life, and possessing congenitally bicuspid aortic valves, die of active endocarditis. The moral of all this is, as Libman remarks, that it behoves us to be much more critical than we have hitherto been in our examination of diseased hearts in the dead-house. Interpretations of our findings must needs be very cautious since the matter is by no means easy. We must endeavour to distinguish (*a*) true congenital defects, (*b*) the sclerotic residuas of effete infections by rheumatism, (*c*) the results of healed bacterial infection, and (*d*) sclerosis from purely mechanical causes. With so many possibilities before us, it is obvious that the task is full of difficulties. I shall return to this matter in dealing with questions relating to pathogenesis.

Goulstonian Lectures

ON THE

DEVELOPMENT OF PSYCHOPATHOLOGY

AND ITS PLACE IN MEDICINE.

Delivered at the Royal College of Physicians of London on March 11th, 16th, and 18th, 1926,

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LECTURE II.*

IN the preceding lecture the development of psychopathology up to the formulation of the conception of suggestion was described, and an attempt was made to examine and evaluate this conception. We may now pass on to consider the history of a school of thought whose tenets are closely allied to those of the suggestionists. This is the so-called "persuasionist school," and its chief protagonists in the literature are Dubois, of Berne, and Dejerine, of Paris. Both are mainly concerned with therapy rather than with ætiology, and ætiology is with both authors regrettably vague and unsystematised, but they differ from one another in certain important respects. For Dubois[1] persuasion is a therapeutic process in which certain effects are produced by chains of logical reasoning, and he distinguishes it sharply from suggestion. He does not deny the potency of the latter, but believes it to be capable only of evil, and he ascribes to it most of the symptoms occurring in the neuropathic conditions which he treats. Persuasion, on the other hand, does not trade upon the blind credulity of the patient, but enables him to understand the erroneous lines along which his thoughts have proceeded and the way in which suggestions have produced an appearance of illness which is not really there, and it thereby gives him the necessary means to correct these morbid effects. Dubois's conception is almost entirely intellectualistic, and ascribes to reason a power as a driving force which it very certainly does not possess. It is an unquestionable fact that his method achieves results, but we are compelled to believe that this is because driving forces other than reason are interpolated, of which the suggestive potency of the physician's personality is probably the most frequent and important. In so far, however, as this suggestive action calls to its aid the patient's understanding, instead of merely dumping into his mind a belief without connexions or logical supports, persuasion may be said to be more integrative than simple suggestion, and to this extent superior to it.

Dejerine[2] is less intellectualistic than Dubois, and appreciates the weakness of reason as a driving force. His conception of persuasion includes not only the logical processes of Dubois, but also the principle that an "emotion" must be introduced in order to make these logical processes effective. He repudiates suggestion as a producer of evil almost as energetically as Dubois, but it is difficult to see how his conception of an emotional persuasion differs in its essentials from that of suggestion. His book is full of practically useful details of treatment, but his ætiological theories are not very precise. He ascribes a number of conditions to what he terms "preoccupation," citing, for example, the frequent functional disturbances of digestive and other organs which may arise from the patient becoming "preoccupied" with—i.e., having his attention fixed upon—the organ in question, and the consequent development

* Lecture I. appeared in THE LANCET of March 20th.

[1] Dubois: The Psychic Treatment of Nervous Disorders, English translation, 1909.

[2] Dejerine and Gauckler: The Psychoneuroses and their Treatment by Psychotherapy, English translation, 1913.

of fears and apprehensions, which ultimately produce the neurosis. There can be no question that this conception of Dejerine's does apply to many cases, and that its application points the way to some valuable psychotherapeutic procedures. If we examine the conception itself, however, it does not seem to be materially different from that of suggestion, and adds but little to the limited understanding of our cases which suggestion is already able to offer. We may, indeed, sum up the whole contribution to psychopathology of the persuasionist schools as an elaboration of the suggestionist theories, except in so far as these schools have to some extent become permeated by more basic conceptions taken over from other investigators whose methods of attack have been altogether distinct. It is the work of these other investigators which has been chiefly responsible for the building of modern psychopathology, and to understand that building we must go back to the last decade of the nineteenth century and trace out the lines of development which diverged from the simple study of suggestion after the time of Charcot, in particular the dissociation conception of Janet and the dynamic conception of Freud.

The immensely important contribution of Janet may be said to have arisen from the blending of two fields of inquiry—the study of hypnotism on the one hand, and that of hysteria on the other hand; both of which had come within the purview of Janet's teacher, Charcot. We have already dealt with the development of hypnotism, but something must now be said of the history of hysteria, and the views of that disorder which held the field at the time when Janet commenced his investigations.

THE HISTORY OF HYSTERIA.

In ancient medicine the phenomena of hysteria were explained by that demonological conception under which all pictures of disease were subsumed, but this magico-religious view seems to have clung longer to hysteria than to other disorders. Its influence was rampant in the Middle Ages, when many hysterical symptoms were regarded as the characteristics of witchcraft, and others were believed to be the result of possession by benign or malignant spirits. The first divergence from the demonological conception, however, is to be found in what may be called the metaphysiological speculations of the Greeks. For Hippocrates hysteria was due to the wanderings of the uterus about the body in search of humidity, and the pressures thereby exerted upon other organs explained the various symptoms observed. Coma and lethargy, for example, arose from pressure on the vessels mounting to the head, suffocation from pressure on the bronchial tubes, palpitations from pressure on the heart, and epigastric oppression from pressure on the liver. Galen rejected the Hippocratic theory on the very solid ground that the anatomical fixations of the uterus did not permit of it wandering about the body, but he substituted for it the scarcely better-founded view that hysteria was the result of engorgement of the uterus by its own fluid or by menstrual blood. Except for the demonological interlude of the Middle Ages, this uterine pathology persisted in various guises down to the seventeenth century, when Lepois,[3] in France, and Thomas Willis,[4] in this country, first put forward the conception that the seat of hysteria was in the brain. The views of Willis are of interest to us here because he observed the causal relationship existing between emotional disturbances and hysteria, but he held that the former acted upon the brain by way of the "animal spirits," which, with the other writers of his time, he regarded as the moving force of nervous action, and therefore his view is essentially physiological and not psychological. Sydenham[5] held that hysteria was a general malady of the nervous system, but here again he supposed this to consist in a disorder of the part producing "animal spirits."

[3] Lepois: Morbus qui vulgo dicitur hystèria, 1620.
[4] Willis: Opera medica: Pathologia cerebri et nervosi generis, 1660.
[5] Sydenham: Dissertatio epistolaris ad B. Coole.

The history of hysteria before Charcot may be said to have culminated in the work of Briquet, who in his "Traité de l'Hystérie," published in 1859, reviewed all the theories which had hitherto been put forward, and tested them in the light of his own observations. Briquet's methods were admirably conceived, and they constitute perhaps the first clear attempt to apply to this sphere the rigid procedure of science. He constantly emphasises the importance of unbiased observations of facts and the avoidance of a priori theories, and strives to base his own views entirely on the careful examination of his 430 cases. He finally concludes that "hysteria is a malady consisting in a neurosis of the portion of the brain destined to receive the affective impressions and the sensations."[6] It will be noted that, although this definition contains some psychological terms, it is essentially conceived in a physiological spirit, and is pathological rather than psychopathological. This view may be said, indeed, to have persisted as the doctrine of "functional nervous disorder" which held the field until comparatively recent times.

Charcot noted that in certain cases of traumatic hysteria the physical accident was not in itself the cause of the illness, but that a part was played by the memories left by the accident, and finally he proposed the view that certain of the symptoms of hysteria were due to "ideas." With this view was laid the foundation-stone of the psychopathological conception of hysteria, and here also we see the beginning of a delimitation of "psychogenic" from other diseases. Charcot himself, however, did not follow out his observation to its logical consequences, but strove constantly to bring hysteria into line with organic nervous disorder. He related its phenomena to those of hypnosis, and observed the effect of suggestion in both, but he regarded hysteria as a definite disease characterised by definite stigmata. He arrived, indeed, at a conception which was the converse of the later one of Babinski in that he held hypnosis to be a manifestation of hysteria, and therefore to be part of a disease in which suggestibility appeared, but did not constitute its essence.

Nevertheless, the seed which Charcot had sown fell upon fertile ground, and was developed into a rich harvest by the researches of Janet.[7] He found that the phenomena of hysteria were capable of being interpreted in psychological terms, and he finally succeeded in formulating psychopathological conceptions which served, at any rate in some measure, to explain those phenomena. The nature and importance of these conceptions will be best understood if a brief description is given of Janet's observations and conclusions with regard to a single group of hysterical symptoms, and for this purpose the familiar anæsthesias may be selected.

In the first place, Janet noted that hysterical anæsthesia frequently had a peculiar distribution. The well-known glove anæsthesia, for example, ending in a sharp line at the level of the wrist, had a distribution which did not correspond to any possible lesion of the nervous system, but which did correspond precisely to something—namely, the patient's idea of his own hand. Clearly, therefore, the incidence of this symptom was determined by a factor of a psychological order, and if this were so, it would be profitable to seek for a psychological conception in order to explain it. Again, these anæsthesias exhibited features of a curiously paradoxical character. It was observed that patients suffering from extensive hysterical anæsthesias involving large areas of the body rarely sustained any accidental injury, whereas patients with far smaller anæsthesias of

[6] Briquet: Traité clinique et thérapeutique de l'hystérie, 1859, p. 601. ". . . l'hystérie est une maladie consistant dans une névrose de la portion d'encéphale destinée a recevoir les impressions affectives et les sensations."
[7] Janet's chief works are: L'Automatisme psychologique, 1889; État mental des hystériques, 1892, English translation The Mental State of Hystericals, 1901; Névroses et idées fixes, 1897; Les obsessions et la psychasthénie, 1903; Les médications psychologiques, translation Psychological Healing, 1925.

organic origin, such as occur, for example, in syringomyelia, frequently sustained such injury. The only conclusion possible would seem to be that the patients must feel with their anæsthetic limbs, as otherwise injury would inevitably befall them. Similarly, it was found that patients with an extreme hysterical amblyopia, which reduced the field of vision almost to a single point, were able to play at ball, a performance obviously out of the question unless the major part of the retina were functioning normally. This paradoxical character appeared most clearly, perhaps, in the case of a boy who developed hysterical symptoms after being concerned in a fire. The symptoms were of two kinds: firstly, the presence of an amblyopia, which cut down the field of vision in both eyes to 30°; secondly, the occurrence of fits, which were originated whenever the patient saw a burning object. Now if the boy were tested with a perimeter in the usual way he was unable to see the paper disc until it had reached the 30° radius. Nevertheless, if a lighted match were substituted for the paper disc, a fit invariably occurred as soon as the match reached the limit of normal vision. Obviously, therefore, the patient could see over the whole field of vision, and equally obviously he was blind to everything outside 30°.

DISSOCIATION OF CONSCIOUSNESS.

In order to explain these features Janet devised the conception of "dissociation of consciousness." He assumed that consciousness, instead of pursuing its course as a unitary stream, could be split into two or more independent currents, so that the consciousness of one current would be unaware of, and uncontrollable by, the consciousness of other contemporaneous currents. Some approximation to this situation occurs normally when we carry out at the same time two independent activities, such as playing the piano and thinking out some problem, but in hysteria the dissociation may reach an extreme degree. Here the sensations arising from an entire limb may be diverted into a current separated from the main stream of consciousness, thereby producing an anæsthesia. Although thus cut off, and incapable of being perceived by the main stream, they can influence the motor apparatus, and thereby determine the phenomena observed—the avoidance of injury by the anæsthetic patient, and the fits in the blind boy. In this way the apparent paradox, that the sensations exist and yet do not exist, can be resolved. The conception of dissociation, therefore, explains the observed facts, but if it is to satisfy the canons of scientific method it must also be capable of verification by an appeal to experience. Actually it does satisfy this further test because, if a method be devised whereby access to the dissociated portion can be obtained, the continued existence of the apparently absent sensations can be experimentally demonstrated. By using the manœuvre known as automatic writing, for example, the anæsthetic arm can be made to record, unknown to the patient, the fact that it is being pricked.

Functional paralyses are similarly explicable, as is also hysterical amnesia. The latter consists in a loss of memory for a certain defined period of the patient's life, extending over days, months, or years, and was a common phenomenon in the psychoneuroses of the war. Here, again, the conception of dissociation presumes that the missing memories are not destroyed but diverted into a current split off from the main stream of consciousness, and once more the validity of this conception can be experimentally demonstrated by hypnotising the patient, and thus recovering the lost memories.

Other hysterical phenomena, such as somnambulism and double personalities, can be explained by a dissociation essentially identical with that responsible for amnesias, but differing in its mode of incidence. In these cases a dissociated current suddenly usurps the field of consciousness, causing a complete break in the continuity of the patient's experience and behaviour. After occupying the stage for a certain period of time the dissociated current is once more submerged, and the patient resumes the thread of his former life, generally without any awareness that it has been interrupted. Hysterical somnambulisms can be closely paralleled by certain conditions artificially produced under hypnosis, and a number of the processes occurring in hypnosis, particularly in its more profound phases, are to be interpreted in terms of dissociation.

The conception of dissociation cast a flood of light on a mass of phenomena which had hitherto baffled all attempts at explanation. It was legitimately constructed according to the canons of science by the careful collection of observed facts and the devising of a formula which would resume those facts. It could, moreover, be tested to any desired extent by constantly comparing the results capable of being deduced from the formula with those actually found by experience and experiment. Finally, it pointed out a road along which therapeutic attempts might hopefully be prosecuted. Certain difficulties have been noted in the application of the concept to some of the phenomena with which it is concerned, but these are due rather to misapprehension of the nature of the concept than to defects in the concept itself. For example, in many cases of hypnotic somnambulism the hypnotic consciousness is aware of the whole range of the patient's experience, whereas what we may call the normal consciousness has no knowledge of the experience belonging to the hypnotic consciousness. At first sight this one-sided and non-reciprocal lack of awareness may seem difficult to explain by dissociation, which would appear necessarily to involve a break between the two streams of consciousness equally untraversable in whichever direction it might be attempted, whereas in the example cited the break is impassable when viewed from the side of the normal consciousness, but traversable with ease when viewed from the side of the hypnotic consciousness. The difficulty is dependent, however, upon a misconception of the nature of dissociation, and an abuse of the spatial metaphor in which it is defined. Dissociation does not, of course, imply an actual separation in space, and from the nature of the phenomena with which it is concerned it obviously can have no real spatial significance whatever. Spatial terms are used because they afford a useful method of describing relationship, but actually the dissociation is a functional dissociation, an "out of gear" relationship, and if this is understood the existence of a non-reciprocal dissociation ceases to be inexplicable.

THE SUBCONSCIOUS.

Janet's conception of dissociation involves necessarily another conception concerning which something must be said, that of the "subconscious." This term has been used in a variety of senses by different authors, but in Janet's work it indicates the existence, contemporaneously with the main stream of consciousness, of mental processes which are independent of and unconnected with the main stream. In this sense it will be apparent that subconsciousness is merely a corollary of dissociation, for a mental process which exists independently of the main stream of consciousness is a dissociated mental process.

The conception of the subconscious has been attacked on the ground that processes which are not part of the personal consciousness are not conscious at all, that they are merely neurological or physiological, and have no psychological aspect. This criticism arises from a complete misunderstanding of the nature and justification of a psychological conception. In the first place, the evidence for the existence of Janet's subconscious processes is precisely the same as the evidence for the existence of any conscious processes whatever. Both are dependent upon inferences from observed facts. If I see my neighbour writing certain words I infer the existence in him of certain conscious processes, but I have no direct experience of the latter; the only

objective facts are the words and the actions I see. Similarly, if a patient's arm writes a coherent and relevant statement, although the patient himself has no knowledge of the fact that his arm is so engaged, or of the subject upon which it writes, I have as much right to attribute consciousness to the mechanism responsible for the statement written by the arm as I have to attribute consciousness to any other aspect of the patient's behaviour.[8] Secondly, the observed facts are not in themselves either physiological or psychological; they are behaviour facts, and the physiological or psychological aspect is only introduced when an attempt is made to devise conceptions to explain them. If explanation is attempted in terms of nerve cells and fibres a physiological conception is employed, if in terms of ideas and memories a psychological conception is employed. It is not that either conception is wrong; both are permissible, and the choice between them on scientific grounds depends entirely upon their relative utility in enabling us to resume and control the facts of experience. To object, therefore, that the facts which Janet interprets by his conception of the subconscious are physiological, and not psychological, is irrelevant and indeed meaningless. The only question at issue is whether in the present state of our knowledge a psychological conception, such as Janet's, permits us to understand, to predict, and to control the facts of hysteria and hypnotism better than a physiological conception. To this question there can only be one answer, although we are quite entitled to hope that ultimately a physiological explanation still more adequate and useful will be devised.

Morton Prince has explored the field opened up by Janet in several interesting directions, and has applied the concept of dissociation to the study of a wide range of phenomena. He has, indeed, used the experimental method in psychopathology more consistently than any other investigator, and his work is a valuable object-lesson of what can be accomplished by this method. In particular his fascinating "Dissociation of a Personality"[9] provides a convincing demonstration of the light which the conception of dissociation is able to throw on the problem of double personality, although, as we shall see later, it also affords an excellent example of the limitations of that conception.

Janet has himself extended the conception of dissociation to a wider field than that of hysteria and hypnosis. He brought into a single disease-entity, under the name of "psychasthenia," practically all the manifestations of the psychoneuroses other than the definitely hysterical. In its symptomatology were included phobias, obsessions, compulsive actions of all kinds, morbid anxiety, and states of doubt and hesitation. This remarkable generalisation gathered together a multitude of syndromes which had hitherto been described as independent disorders under such names as "folie de doute," agoraphobia, and so forth, and conceived them all to be merely different aspects of one and the same essential disturbance. The essential disturbance consisted in a dissociation analogous to that responsible for hysteria, although differing from the latter in certain important respects. Starting from the assumption that normal adaptation to reality requires the integration of a number of relevant mental processes, Janet held that both hysteria and psychasthenia are due to a failure of this necessary integration owing to the presence of dissociation. In the case of hysteria the dissociation is molar—that is to say, masses of processes are entirely split off from the main stream—thus producing the anæsthesias, paralyses, and somnambulisms. In the case of psychasthenia, on the other hand, the dissociation is molecular, the various processes not being completely segregated from one another but merely loosened in their interconnections, so that the firm integration required for efficient adaptation to reality cannot be obtained. In Janet's "Les Obsessions et la Psychasthénie" this principle is worked out in an extraordinarily ingenious manner, and it cannot be denied that it has some value as an explanatory concept. Nevertheless, although it gives us a measure of help and understanding in this complex and difficult field, there is little doubt that the conception of molecular dissociation is unduly wide, and describes a process so elementary and universal that it brings together diverse clinical pictures between which only a superficial resemblance can be traced. We see here, as we have already seen in the case of suggestion, that besetting tendency to generalise a valuable conception until its explanatory value becomes seriously impaired.

THE PLACE OF DISSOCIATION IN PSYCHOPATHOLOGY.

We may now pause to consider the place in psychopathology of the conception of dissociation. Even in the wide sense which has just been discussed it has a certain value in that it emphasises the important principle that the processes composing mental activity are not uniformly bound together into a single stream, but may possess varying degrees of independence, a principle which gives us some understanding not only of psychasthenia, but also of the hallucinations, delusions, and other phenomena met with in the psychoses. It has been said, however, that this principle is so general in its application that it does not give much help in the interpretation of individual pictures of disease, and dissociation will therefore be a more valuable concept if it is limited to the original sense in which Janet brought it forward to explain the symptoms of hysteria.

There is no necessity to recapitulate the merits of this conception and the light that it has shed on the understanding and control of certain phenomena. Something must be said, however, concerning its limitations and defects. To begin with, it does not seem to be applicable to all the phenomena which occur in hysteria. It explains the anæsthesias, for example, but hardly the hyperæsthesias. On the other hand, it explains conditions which occur outside the range of hysteria, such as the automatisms of epilepsy. Janet may be said, indeed, to have discovered a concept of considerable value throughout the whole range of psychopathology rather than one which will explain all the phenomena of any one part thereof. Secondly, its explanatory value is limited. It enables us to understand that the characters of hysterical anæsthesia or paralysis are due to a splitting of consciousness, but we are immediately faced with the further problem as to *why* this splitting takes place. Dissociation may, in fact, be regarded as an "anatomical" as opposed to a "functional" conception. This is well seen in Prince's "Dissociation of a Personality." In it we have an illuminating analysis whereby the speech and behaviour of a patient is shown to be a manifestation of the activities of a number of distinct personalities, but the question as to the conditions responsible for this splitting—in other words, why the dissociation has occurred—is left without satisfactory answer. Dissociation therefore takes us a certain distance in the understanding of our patients, but leaves us with the further problem of explaining the dissociation itself.

Janet has himself appreciated this limitation, and sought to overcome it by his doctrine of "psychological tension." This is a property which varies in a manner analogous to the pressure of the atmosphere, the variations being produced by constitutional, emotional, and other causes. When it is high, mental processes are integrated with comparative ease and efficient adaptation to reality is attained. When it is low, the required integration is impossible and dissociation of some kind occurs, either the molar

[8] It must, of course, be noted that Janet's conception of the subconscious is to be sharply distinguished from the conception of the "unconscious," and that the foregoing argument is not applicable to the latter. The "unconscious" will be discussed subsequently. A more detailed treatment of both these conceptions, and of their relationship, will be found in the author's The Conception of the Subconscious, Jour. of Abnorm. Psychol., 1909, reprinted in Morton Prince's Subconscious Phenomena, 1915.

[9] Morton Prince: The Dissociation of a Personality, 1906.

dissociation of hysteria or the molecular dissociation of psychasthenia. This is not a very satisfying explanation, however, and seems to come perilously near explaining the incidence of dissociation by a hypothetical capacity of dissociability. It is true that Janet has gone further in that he has emphasised the part played by emotions and the automatic development of affectively toned "idées fixes," and may be said, therefore, to be the forerunner of the dynamic interpretation of the psychoneuroses, but this dynamic aspect is not clearly followed up.

The stage in the history of psychopathology marked by the conception of dissociation is comparable to that existing in the history of astronomy at the time of Kepler. Kepler had shown that the planets move in ellipses round the sun, but he could not explain why they did so. This latter achievement was the work of Newton with his formulation of the law of gravity. Newton's step was based on the conception that the phenomena observed were the result of certain hypothetical forces, interacting in accordance with certain precisely definable laws. It thus added a dynamic conception as a means of understanding the observed sequence of phenomena. The corresponding step in the construction of a psychological conception capable of taking us beyond the level reached by dissociation clearly required a similar advance to a dynamic point of view, and it is the attempt to make this advance which actually characterises the later history of psychopathology.

DYNAMIC CONCEPTIONS IN PSYCHOPATHOLOGY.

The dynamic conception in psychopathology has derived its chief impetus from the work of Freud, but it must not be forgotten that a parallel dynamic aspect made its appearance in academic psychology with the development of the conception of instinct. The view that instinct, or rather various instincts, can be regarded as driving forces whose action and interaction produce the mental phenomena and behaviour of man has received its best-known expression in the work of McDougall. He defines instinct as "an inherited or innate psycho-physical disposition which determines its possessor to perceive, and to pay attention to, objects of a certain class, to experience an emotional excitement of a particular quality upon perceiving such an object, and to act in regard to it in a particular manner, or, at least, to experience an impulse to such action."[10] For example, the instinct of flight determines us to perceive dangerous objects or situations, to experience the emotion of fear, and to act in a manner which will remove us from the source of danger. This definition is open to criticism, and especially is it doubtful whether the position assigned therein to emotion is correct. It would seem that emotion is manifested when the action of an instinct is inhibited—e.g., fear, when it is not possible to remove ourselves from the source of danger—rather than in the normal course of an unobstructed instinct. We are not concerned here with details of this character, however, but only with the general conception of instinct as a driving force capable of explaining the activity of man. It is clear that psychology has thus obtained a dynamic conception enabling it to emerge from the arid paths of academic introspection and mere description to which it was so long condemned. By the aid of this dynamic standpoint a vista is opened up whereby psychology is no longer limited to recording the "how" of the phenomena with which it deals, but can attempt an answer to the question "Why?" It can attempt to conceive the sequence of thought and behaviour in man as a result of the interplay of various instinctive forces acting according to precisely definable laws, and if this attempt is successful psychology will have been lifted from the level of a descriptive science to that long ago attained by such sciences as chemistry and physics.

The question immediately arises, however, whether a psychological conception of this character is permissible in science. The naïve notion that it deals with flimsy abstractions unworthy of being ranked with such solid realities as electrons and ether waves has already been discussed, but there is a more substantial difficulty to be considered. The conception has a teleological aspect, and introduces an element which is not only psychological but which has no correlate or parallel in physics—namely, the element of "purpose." According to McDougall, an instinctive process is not completely explained by a *vis a tergo*. It not only moves towards an end, but the existence of that end is a determining factor throughout, and may continually modify the process during its whole course. In other words, the process not merely happens to serve a purpose, but is actually in part determined by that purpose. Now it is sometimes held that the introduction of purpose as a determining factor is incompatible with the notion of causality, and that, as causality is the foundation-stone of scientific method, no conception involving purpose can have a place in science.[11] A long war has been waged against this mechanistic limitation of science and, although it is obviously impossible here to deal with the subject adequately, something must be said, because to admit this limitation would necessitate the expulsion of modern psychopathology from the domain of science.

Psychological conceptions are characterised by the fact that they are couched in terms of experience, and, as purpose is clearly an integral part of our experience, there is no objection on this score to the incorporation of purpose in a psychological conception. The further question whether purpose is consonant or incompatible with causality requires for its answer a precise definition of this latter word, and it is apparent that it is used in two senses which are by no means identical.[12] In one sense it indicates an unconditional sequence, the fact that (*a*) is inevitably followed by (*b*). In this sense there seems to be no reason why purpose should be excluded from causality; it takes its place as one of the factors determining a particular sequence of phenomena. If we can ascertain the existence of this and the other conditioning factors, and are acquainted with their laws of action, we can predict the course of future phenomena and thus satisfy the essential criterion of the method of science. There is a second sense, however, in which the word causality is used. Here it indicates not merely inevitable succession, but a relation of identity between cause and effect. The effect is regarded as the cause in a new form. For example, when we say that heat is the cause of motion we mean that motion is the equivalent of heat in a new form. Heat is conceived as being the vibration of particles, and hence motion can be regarded as a continuation of the same phenomena. In this sense causality is an equation, and one which is essentially reversible, so that the sequence of cause and effect can be equally well replaced by the sequence of effect and cause. This is the sense in which causality is understood in the mechanistic sciences, and it would seem that it cannot be applied to purposive psychology, for a sequence in which purpose is playing a part clearly is not reversible and cannot be regarded as an equation. The introduction of purpose, therefore, removes psychology from the mechanistic sciences, but this does not justify its removal from the whole field of science. The method of science requires the assumption of causality in the first sense, but not necessarily in the second sense, and in the first sense causality is as integral a part of purposive psychology as it is of any other branch of science. If it were insisted that causality in the second sense is an essential constituent of science, then not only psychology, but physiology and biology also, would have to be excluded, because in the conceptions of all branches of knowledge dealing with life processes irreversibility of the sequences has necessarily to be admitted. The inapplicability of the narrower con-

[10] McDougall: An Introduction to Social Psychology, sixteenth edition, 1921, p. 29.

[11] This is the standpoint taken by Jung, cf. Jung, Analytical Psychology, second edition, 1917, pp. x. and xv. A vindication of "purpose" as an integral factor in psychology will be found in McDougall, An Outline of Psychology, 1923.

[12] Höffding: The Problems of Philosophy, 1905, p. 66.

cept of causality is not, therefore, a peculiarity of psychology, but a peculiarity of all the biological sciences, and the circumstances we have considered merely indicate that psychology is extra-mechanistic, but not extra-scientific.

THE THEORIES OF FREUD.

This digression has been necessary in order to justify the incorporation into science of conceptions involving the element of purpose, and we may now return to the later history of psychopathology in which conceptions of this character play a prominent part. This later history is inseparably bound up with the work of Freud, to whom the most noteworthy advances in psychopathology are unquestionably due, whatever view we may ultimately reach concerning the validity of many of his doctrines.

Freud's conceptions have undergone an extensive development during the course of his career, and it is impossible here either to trace out this development in detail or to give any adequate account of his theories as they stand to-day. An acquaintance with their general characters must be assumed, and we shall select for consideration only certain broad features which are relevant to our present problem.[13]

In 1880 Josef Breuer, of Vienna, investigated a case of hysteria in which he observed the traumatic effect of certain memories of which the patient was unconscious, and the therapeutic result obtained by bringing these memories once more into consciousness. This investigation, although it was not published until many years later, was the starting point of Freud's work. In 1893 he brought out, in association with Breuer, a preliminary paper, and in 1895 the "Studien über Hysterie," which may be said to express the first stage of Freud's development. The keynote of this stage, the view that "the hysteric suffers mainly from reminiscences," is not essentially different from Janet's notion of "idées fixes," which certainly preceded in time Breuer and Freud's publication, although it is claimed that the latter had a quite independent origin. There is apparent in the work of Breuer and Freud, however, a much more definite dynamic formulation than Janet had attained, and new conceptions of fundamental importance, such as "repression" and "resistance," were laid down. To this period belongs the use of hypnosis as a method of recovering buried memories, the conception of "psychic trauma," and treatment by "catharsis"—that is to say, the bringing to consciousness of the traumatic memory and its "abreaction" by allowing it to obtain the normal emotional expression which had formerly been denied to it. We need not concern ourselves here with these conceptions except to note that hypnosis was abandoned by Freud many years ago, as was also the notion of "psychic trauma," and that treatment by catharsis only bears a remote resemblance to the modern method of psycho-analysis.

After the dissolution of the partnership between Breuer and Freud the latter proceeded independently and produced a succession of works in which the earlier conceptions were considerably modified, extended, and made more systematic and precise. Although the development has been continuous, it will be convenient to postpone for the moment the consideration of the later additions, and to devote our attention to the theories as they stood before the war. The essential structure, with which we are alone concerned, remains the same to-day, but it is easier to see and to examine without the accretions and amplifications of the last decade.

The essential structure may be very briefly and inadequately sketched as follows. The phenomena of conscious life and behaviour are conceived as the result of the interaction of a number of psychological "forces" which interact according to precisely definable "laws." These forces, which are in part conscious and in part unconscious, may work harmoniously together, or they may conflict with one another. In the latter case an attempt at adjustment occurs, and this attempt may proceed in various possible ways. Certain of these ways involve the repression of one of the opposing forces—that is to say, one of the forces is put out of gear, as it were—and is no longer allowed to manifest itself normally in consciousness or in action. It becomes unconscious, but does not thereby cease to exist or to be capable of functioning. It can no longer influence thought and behaviour in a normally direct manner, but it produces various indirect effects. For example, the sex instincts in an elderly unmarried woman, repressed because of their incompatibility with her moral code, and with the circumstances of her life, may express themselves in consciousness as an abnormal interest in births, marriages, and scandals. These indirect effects manifest themselves by means of certain mechanisms which Freud precisely defines, such as compromise, condensation, representation by the opposite, and so forth. Mechanisms of this character are responsible for many phenomena in everyday life, slips of the pen and of speech for instance, for the content of dreams, and for the various symptoms manifested in the psychoneuroses.

It must be understood that the foregoing is only an attempt to describe in general terms the supporting columns on which Freud's theories appear to rest, and does not correspond to the actual way in which these theories were developed. Freud's attack was entirely empirical, and he subjected the psychoneuroses to a prolonged clinical study, only slowly and tentatively building up theoretical conceptions to account for the phenomena which he had observed. It will be noted that, in form at least, this course is entirely irreproachable from the standpoint of the canons of science. After his abandonment of hypnotism as a means of investigation he evolved the method of psycho-analysis, and it is by the use of this method that practically all the facts of observation upon which the Freudian theories rest have been collected. We shall have subsequently to describe it, and to evaluate its claim to rank as a trustworthy instrument of research. At present, however, we are concerned with the results of its employment rather than with the instrument itself.

In the course of his psycho-analytic investigations of the phenomena of the psychoneuroses Freud noted that the conflicts underlying the symptoms were invariably conflicts between forces belonging to two radically distinct groups. The first group comprised forces apparently emanating from the sex instincts, the second group forces connected with the personality. To the first Freud gave the name of "libido," to the second that of "the ego," and he conceived that a psychoneurosis developed owing to a certain failure of adjustment between these two or, as he has himself expressed it, "when the ego loses its capacity to deal in some way or other with the libido."[14] In view of the important part played by the libido Freud subjected this to a careful examination in order to determine its precise mode of development, and as a result of this examination he reached the remarkable conclusions constituting the well-known "sex theories." According to these theories sex, as we know it in the adult, is not a function which suddenly emerges at puberty in a manner comparable to the birth of Minerva, but is the final stage in a long process of development starting from the dawn of life. Although its early manifestations are very different from the adult function, the term sexual can justly be applied to the former, because the latter is clearly developed therefrom. Moreover, many tendencies not generally regarded as sexual—for example, parental and filial love, and indeed all the processes to which the word "love" can be applied—must similarly be brought within the sphere of the libido, because they also can be shown to

[13] Freud's chief works are: Studien über Hysterie (with Breuer), 1895; Die Traumdeutung, 1900; Zür Psychopathologie des Alltagslebens, 1901; Drei Abhandlungen zür Sexualtheorie, 1905; numerous shorter papers collected into five Sammlungen kleiner Schriften zür Neurosenlehre; Vorlesungen zür Einführung in die Psychoanalyse, 1917; Jenseits des Lustprinzips, 1920; Massenpsychologie und Ich-Analyse, 1921; Das Ich und das Es, 1923. Practically all have now been translated into English.

[14] Freud: Introductory Lectures on Psycho-analysis, Englis translation, 1922, p. 323.

originate from the common fount. The earlier stages in the development of the libido are distinguished by differences both in the objects towards which the libido is directed and in the parts of the body with which the libido is associated, and these differences characterise definite stages through which the libido passes in its progress to adult normality. Thus in the earliest stages the libido is directed on to the individual himself, later on to one or both parents, and only in its final development is it directed on to other persons of the opposite sex. Similarly in earlier stages the libido is associated with other parts of the body than the genitalia—for example, the mouth and anus—and only later does the genital zone assume the primacy which characterises adult sex.

Freud observed that the psychoneuroses were associated with a failure in this process of development, the normal evolution being partially arrested at an early stage. A very important stage in this respect was that at which the libido was directed on to one of the parents, generally the parent of the opposite sex. A failure of adequate development here meant that the libido was fixated at this stage and could not undergo its normal evolution. This fixation was invariably found in certain types of psychoneurosis, and the conflict, which resulted when the claims of later life demanded a normal distribution of the libido, was responsible for the outbreak of the symptoms. In other conditions fixation at other levels were found to be present, and in a word the whole structure and development of the psychoneuroses could be worked out in each individual case by the application of these conceptions.

This description, condensed and generalised to an extent which is hardly consistent with accuracy, will have to serve for our immediate purpose—namely, the estimation of the Freudian theories, both in their form and content, by the canons of scientific method. To begin with, it is clear that with conceptions of this character a goal has been attempted far beyond that achieved by the dissociation conception of Janet. The essential mark of the advance lies in the move forward to a dynamic point of view, and the endeavour to account for the observed phenomena by the action of precise forces working according to precisely definable laws. Similarly the goal attempted is far beyond that reached by the suggestionist and persuasionist schools, because, although suggestion is a dynamic concept, it is immeasurably inferior in precision and manageability to the concepts which Freud has constructed. It is unnecessary to point out, therefore, that Freud's attempt is a very notable one, and if it can be established, either in whole or in part, it must rank amongst the great achievements of the world. The importance of ascertaining how far his methods are consonant with the method of science, and how far the observed facts justify his conclusions, cannot be overestimated, and the magnitude of the issue requires that this should be done with the utmost care and consideration. We may endeavour to approach the problem by a preliminary examination of certain of Freud's fundamental conceptions, and may take in order the conception of the unconscious, the mechanisms, and the sex theories.

FREUD'S CONCEPTION OF THE UNCONSCIOUS.

The conception of the unconscious is an integral part of Freud's theories. He holds that the processes we term conscious are only a superficial layer, as it were, of the total sum of mental processes. There are two other layers—the preconscious, comprising those processes which, although not conscious at the moment, may at any time become so; and the unconscious, comprising processes which are not only not conscious at the moment, but are prevented from becoming conscious by a barrier only to be circumvented under special circumstances. The unconscious processes are nevertheless able to influence consciousness in various indirect ways. Freud formulates very precisely the nature, characters, and mode of action of the processes contained in the unconscious.

The conception of the unconscious has been subjected to much adverse criticism. It is said that it involves a contradiction in terms, as consciousness is the essential character of mental processes, and an unconscious mental process therefore an absurdity; that the processes in question are not psychological at all, but physiological, and that they should be conceived not in terms of consciousness, but in terms of brain. These criticisms arise from a confusion of thought. The unconscious is not a phenomenal reality, but a concept fashioned in order to explain the phenomenal reality. The phenomenal reality, consciousness, obviously forms a disconnected series and, if the psychologist is compelled to take only this into account, he cannot rise beyond the level of a mere description of psychic phenomena. To obtain understanding and continuity it is necessary to go beyond the phenomena and to construct an explanatory concept. The physiologist has, of course, a perfect right to construct for this purpose a concept in terms of brain, but he cannot deny to the psychologist an equal right to construct a concept in psychological terms. The question is not whether one is correct and the other incorrect, but which one works the best in the present state of our knowledge. So far as the phenomena which Freud seeks to explain are concerned, the physiologist cannot yet give an explanation which consists of more than words, and the fact that these words indicate hypothetical material processes rather than hypothetical psychical processes is an inadequate consolation for his entire inability to make any use of the conceptions he fashions. The psychologist is therefore perfectly justified in attempting to find an explanation by the construction of a psychological conception, at any rate until the physiologist can provide one which is practically more useful, and such a conception must involve the assumption of an unconscious in one form or another. If consciousness is defined as the essential attribute of mental processes, then, of course, the "unconscious" becomes a contradiction in terms, but as the question is already begged by accepting the definition this is not of much moment. We saw, when discussing Janet's conception of the subconscious, that there is convincing proof that mental processes exist which are not personally conscious, and such processes are unconscious from the standpoint of the personal consciousness. It may be added that, even if the notion of the unconscious were contradicted by our experience of phenomenal reality, this would not necessarily preclude it from ranking as a scientific concept, because a concept is a construct and not a phenomenal reality. An unconscious mental process, for example, would not be more absurd than a weightless and frictionless ether. Criticisms directed against the unconscious as a possible conception do not carry much weight, therefore, and we have seen that a conception of this kind is necessary if the psychologist is to be allowed to explain the phenomena of consciousness in psychological terms.[15] The question whether Freud's particular conception of the unconscious is valid is, of course, another matter. On the score of method there is no objection whatever to its form and structure, but to satisfy the canons of science it must be shown that it is based on accurately observed facts, that it explains those facts, and that the deductions which follow from it when tested by experience and experiment are always found to be verified. These are the only criteria which have any relevance if the value of Freud's concept is to be satisfactorily estimated.

The mechanisms—that is to say, the modes of action whereby the various intrapsychic forces produce the phenomena they are invoked to explain—need not be considered in detail. Here belong the conceptions of conflict, repression, and the effects upon consciousness and behaviour which a repressed system is capable of producing. This portion of Freud's work

[15] Freud's conception of the unconscious differs fundamentally from Janet's "subconscious," and the considerations which justify the one are not applicable to the other. Cf. footnote (8).

has obtained wide acceptance and recognition, extending far beyond the limited circle of Freud's orthodox followers, a circumstance due in some part to the fact that the principles in question were found to be remarkably applicable and illuminating in the study of that great mass of psychoneuroses produced by the war. Here, again, the conceptions are certainly constructed legitimately so far as their form is concerned, and their validity must be determined, as in the case of the unconscious, by an appeal to the facts and to experience.

In contrast with the comparatively favourable reception accorded to the mechanisms, the sex theories have been the subject of most vigorous attack and rejection. Certain criticisms have been based, sometimes explicitly, but more often implicitly, on ethical or æsthetic grounds. Objections of this kind have, of course, no place or relevancy in positive science, and only require to be mentioned in order that they may be at once dismissed. Other criticisms have more weight. It is held that to reduce all the phenomena of the psychoneuroses to the action of the sex instincts is an unduly narrow view, and that other instinctive forces without admixture of sex elements are equally capable of causing these disorders. It would seem, for example, that the psychoneuroses of the war were certainly due to intrapsychic conflicts, but to conflicts between forces in which sex played no part. We shall see subsequently that the Freudian school has met this latter objection with regard to the war psychoneuroses by a further extension of the already wide denotation ascribed to sex. For the moment, however, it is merely necessary to note that disputes of this kind can only be settled by an appeal to the facts of observation, and not by a priori considerations. A generalisation is unduly wide only if it can be shown that the facts do not fit into it, and it is no more inherently impossible that the sex instinct should account for all the phenomena of the psychoneuroses than that so simple a principle as gravity should account for all the movements of the planets. Once more, therefore, we are led to the conclusion that we cannot quarrel with the form in which Freud's sex theories are cast, and that they are legitimate attempts to explain the facts. As in the cases of the unconscious and of the mechanisms, the crux of the matter is whether these conceptions do fit the facts, and fit them in a manner satisfactory to the canons of science. It is unfortunately necessary to labour this simple and obvious point, because many critics of Freud appear to forget that all theories can only be appraised by an examination of the facts, and that, just as a theory can only be legitimately constructed on the careful observation and recording of phenomena, so it can only be destroyed by recapitulating the observations or, as it were, making control experiments. This essential work is often altogether neglected, and its place taken by ex cathedra statements, whose foundations in prejudice are sometimes only too obvious. An examination at the level of the facts of observation, therefore, must clearly be the chief task in any reasonable attempt to judge the value of Freud's conceptions.

THE LATE DR. G. E. GABITES, C.B.E.—News has been received of the death on Jan. 5th of Dr. George Edward Gabites, a well-known member of the medical profession in South Canterbury, New Zealand. He was born in Christchurch in 1867, and after being educated locally, went to Edinburgh, where he graduated in science at the University in 1891, proceeding to the M.B., C.M. three years later. He was appointed resident physician at the Royal Infirmary and later became resident surgeon at the Royal Maternity and Simpson Memorial Hospital, and medical superintendent at the Edinburgh Provident Dispensary. In 1898 he obtained the Fellowship of the Royal College of Surgeons of Edinburgh and in 1899 was appointed surgeon superintendent of the Timary Hospital, New Zealand. Subsequently he served in the South African War with the New Zealand contingent and for his services was awarded the Queen's Medal with four clasps. During the late war he was Captain Commandant of the N.Z. Medical Corps in the training camp at Arapuni, and was A.D.M.S. of the Otago military district. Dr. Gabites leaves a widow and two sons.

THE TREATMENT OF ILEUS BY CHOLINE.

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WHILE engaged in an investigation of the rhythmic movements of the small intestine in 1912 Weiland made the chance observation that when a piece of isolated intestine was allowed to contract in Ringer's solution for some time the fluid acquired the property of exciting contraction in other pieces of intestine placed in it. Le Heux, another worker in Magnus's laboratory in Utrecht, isolated the substance causing this effect and identified it as choline. This base has come into prominence at various times in physiological literature and is related chemically to muscarine, the principle found in poisonous mushrooms. Le Heux was able to transform the small amount of choline obtained into acetyl choline, and obtained the powerful physiological effects observed by Reid Hunt and by Dale.

It is known that when the alimentary canal is nearly completely cut off from its central nervous supply by severing both vagi and both splanchnic nerves digestion proceeds almost undisturbed. The normal rhythmic movements of the gastro-intestinal canal continue without hindrance. The plexus of nerves known as Auerbach's plexus, existing between the longitudinal and circular layers of the musculature of the intestine, evidently receives its stimulus elsewhere than centrally.

We know that the rhythmic movements of respiration are initiated by changes in carbon dioxide or hydrogen-ion concentration in the blood. It was the analogy with the action of carbon dioxide which led Magnus to conclude that choline acts as the hormone of intestinal movement. That choline is specific in its action on the intestine is shown by the fact that it does not affect the rhythmicity of the heart or of the uterus.

The origin of choline is still unknown. Neither the food nor the suprarenals appear to be the source of the base. The intestine endeavours to retain its store of choline, and it is found in the intestinal wall even in conditions such as prolonged chloroform narcosis and peritonitis. It is known that the salts of acetic and pyruvic acids stimulate peristalsis strongly and the reason for this action is now clear. It is the choline esters of these two organic acids which have a powerful effect on intestinal movement; indeed, the acetic ester of choline is 1000 times as powerful as the base itself in exciting peristalsis. It would seem, therefore, that the acid radicle couples up with choline in the intestinal wall and produces an effect which has hitherto been ascribed to the acetate or to the pyruvate alone.

In a series of articles by workers in Magnus's laboratory it was shown that paralysis of the bowel produced in cats by long-continued chloroform narcosis was speedily relieved by the intravenous injection of 5–15 mg. of choline per kilo body-weight of choline hydrochloride. Strong gastro-intestinal movement, as seen by X ray photographs, took place almost immediately, followed by evacuations in the following 20 hours.

Arai brought about peritonitis in cats by the intraperitoneal injection of iodine solution. Depending on the dose, any degree of ileus could be produced. The paralysis was overcome by an injection of choline. The production of a typical operative ileus in animals simulating that seen in man was successfully imitated by exposing the intestines of an animal to the air through an abdominal incision combined with manipulation. In such cases no evacuation of fæces

* Assisted by a grant from the Medical Research Council.

took place in 30 hours unless choline was administered. When this was done a normal stool followed in a short time.

Finally, Arai produced a severe infective peritonitis in cats by the injection of a mixture of *B. coli* and staphylococci. In those animals which survived there occurred intestinal paralysis. The injection of choline resolved the ileus. An analysis of the intestinal wall showed that a normal content of choline was present. The paralysis was due to a lessened sensitivity of Auerbach's plexus. Only when the choline content of the blood was raised above the normal did this nerve system respond with increase of tonus and peristaltic movement.

Following on the work of Arai, Magnus investigated the toxicity of choline with a view to using it therapeutically. It was found that the safe dose in cats by intravenous administration was 20 mg. per kilo. Much larger concentrations were borne when the drug was injected intravenously at a slow rate. When injected in the amount of 0·8 mg. per kilo per minute large amounts could be borne without the least distress. The work of Le Heux shows that choline hydrochloride solutions decompose and become toxic unless they are specially prepared and kept in ampoules of resistant glass. Messrs. Merck put up the sterile solution in ampoules in a way which fulfils the requirements of Magnus and Le Heux. When properly prepared the solutions will remain undecomposed for at least four years.

The administration of choline in cases of ileus was taken up by Klee and Grossmann in Romberg's clinic in Munich and a report presented at the Congress for Internal Medicine in Vienna in 1923. It was used in peritonitis, in chronic atony of the stomach and intestines, and in atonic constipation. In all these cases its use was successful. Its value in nervous dyspepsia could be accounted for by the fact that treatment of decerebrate cats with choline did not permit subsequent inhibition of the stomach movements by stimulating the sympathetic.

Through the kindness of Prof. Magnus, one of us was given a supply of choline hydrochloride and with it the following cases have been treated. The number is small, but, as far as we are aware, no reports of its use have appeared in England. It was thought it would be of service to give the results of its administration.

Clinical Records.

CASE 1.—Mrs. S., aged 47. On March 21st, 1923, panhysterectomy was performed for a very large fibroid uterus filling the whole pelvis and extending 1½ in. above the umbilicus. 24th: Much distension and pain for past 24 hours. Frequent vomiting with slight rise of temperature. Several high enemata with turpentine failed to relieve, and no flatus was passed. That evening the incision was reopened, and a considerable amount of slightly blood-stained peritoneal fluid was evacuated. The large intestine was hardly distended, but the coils of small intestine which presented were very much so. It was found that after removal of the pelvic tumour its place had been taken by quite half the small intestine. This also was distended and to some extent imprisoned in the pelvis. The mesentery had become much stretched, especially over the sacral prominence, and there were signs of early thrombosis in the mesentery which was œdematous. The coils were freed and the incision closed. 25th: No improvement. Choline administered with no effect, the patient dying the same night.

Summary.—A case of intestinal paralysis due to distension and partial fixation of coils of small intestine which, after removal of a large pelvic tumour, had taken its place. Choline was administered when it was proved by exploration that intestinal obstruction was absent. The administration was too long postponed and no chance therefore was given to test its value.

CASE 2.—Mrs. G., aged 75. June 21st, 1923: Panhysterectomy was performed for adenocarcinoma and the patient stood the operation exceedingly well. 23rd: The patient did well to date, but was getting uncomfortable with distension. Pituitrin followed by enemata resulted in the passage of small quantities of flatus only. 24th: Further enemata after four doses of eserine failed to produce any result, and the patient was getting exceedingly distressed. At 6 P.M. choline was administered. Immediately afterwards she complained that she was soiling the bed. This was so, but only to a slight extent. During the night colicky pain was very much complained of, and a gravitation enema early next morning produced a fair result. Eserine and enemata were persevered with and the bowels commenced to act well. She made an uninterrupted recovery and is now, two and a half years later, in perfect health.

Summary.—A case of ileus following prolonged and severe operation in an elderly stout woman. Choline appeared definitely to restore muscular tone and contraction in the intestinal wall.

CASE 3.—Mrs. R., aged 38. Sept. 23rd, 1924. This patient had had a precipitate labour on the previous day and was admitted to hospital as a case of acute intestinal obstruction. She complained of much abdominal distension, and for 24 hours no flatus had passed in spite of enemata. She had vomited twice. She stated that she felt well except for abdominal uneasiness. The abdomen was greatly distended, but there was no rigidity. Numerous coils of much distended gut could be seen through a thin abdominal wall. That afternoon the patient vomited again. In the evening, as the pulse had risen and an enema had failed to produce even flatus, it was decided to explore, though her general condition as a whole remained excellent. It was thought advisable not to await the onset of a more critical condition. A mesial hypogastric incision was made and the whole intestine was found uniformly distended. No cause of obstruction could be detected. A large rectal tube was passed a good 18 inches, aided by a hand over the pelvic colon within the abdomen. Much fluid fæces and flatus were passed by this means before the patient left the table. 24th: The distension was as great as before, but the general condition remained good. Enemata through the rectal tube, still in situ, failed to produce any result. 25th: The same condition as on the previous day with no relief of symptoms and signs. 4.30 P.M., choline administered. Within 20 minutes of the administration ending a copious motion was passed, followed by another later in the evening. 28th (three days after choline): The bowels had been acting normally for two days with the aid of mild laxatives.

Summary.—A case of pure ileus following the sudden emptying of the abdomen of a large tumour (full term ovum). At first thought to be an acute intestinal obstruction. This disproved by abdominal section. Choline immediately re-established intestinal function after all other remedies had failed over the space of three days.

CASE 4.—Mrs. M., aged 34. Dec. 2nd, 1924: The patient was admitted to hospital as an emergency at the end of her eighth month of pregnancy, as there had been irregular losses throughout pregnancy and she was bleeding freely at the time. The cervix admitted one finger and a central placenta prævia could be felt. There were no pains. It was thought that the best treatment was immediate delivery by Cæsarean section, and she stood the operation exceedingly well. 6th: Patient has had considerable colicky pain requiring morphia. 7th: There was much vomiting and great distension with a rapid poor-volume pulse. A turpentine gravitation enema following 0·5 c.cm. of pituitrin, though producing a slight result, did not relieve either the distension or the distress. 9 P.M.: Choline given. Some flatus passed during the night. 8th: Pituitrin 0·5 c.cm. and eserine gr. 1/100, followed by a turpentine enema, produced a good result. 9th: The same good result followed similar treatment. By the next day the normal intestinal function had become established.

Summary.—An otherwise healthy woman suffering from acute ileus as the result of suddenly emptying the abdomen of a large tumour (full term ovum) by abdominal section. Choline re-established the normal intestinal function within 36 hours.

Conclusion.

The administration of choline is a simple matter. Sterile choline hydrochloride is put up in glass ampoules containing 600 mg. in 6 c.cm. This solution is diluted with 180 c.cm. of sterile normal saline and the resulting solution injected intravenously. An important point in administration is that it should take at least 17 minutes to inject the whole quantity. On every occasion except one an ordinary saline infusion apparatus with a narrow intravenous needle was used.

(*References at foot of next page.*)

THE AMOUNT OF ANTITOXIN TO STREPTOCOCCUS SCARLATINÆ PRESENT IN THE BLOOD OF CONVALESCENT SCARLET FEVER CASES.

A REPORT TO THE MEDICAL RESEARCH COUNCIL.

BY HERBERT HENRY, M.D. LOND.,
AND
F. C. LEWIS, M.R.C.S. ENG.
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IN a previous report [1] it has been shown that a ready means of obtaining the toxin of *Streptococcus scarlatinæ* consists in the preparation of "floating" surface cultures of the organism on serum agar Roux bottles, and in the separation of the condensation water from these after 24 hours' incubation. At this period in our observations there was little evidence from American sources in regard to the stability of the toxin, apart from its apparently remarkable resistance to heat, and we deemed it necessary to make attempts to obtain the toxin in dried form. As a result of these experiments it was found that fractional precipitation with alcohol provided in dried form a toxin of considerable concentration, and subsequent experience with products so prepared and kept in desiccators over sulphuric acid has proved that these sustain no detectable loss in potency over a period of ten months.

TABLE A.—*Scarlet Fever Convalescent Children.*

No.	Sex.	Age.	Day of disease.	Blood-group.	Amounts of serum titrated against five skin test doses.				
					0·1	0·04	0·02	0·01	0·004
2	F.	12	33	1	–	–	–	+	+
3	F.	11	29	3	–	–	+	+	+
5	F.	5	26	2	–	–	+	+	+
6	F.	5	30	2	–	+	+	..	..
7	F.	10	30	4	–	–	–	+	+
27	M.	13	24	4	–	–	–	+	+
30	M.	10	21	–	–	–	–	+	+
31	F.	8	63	2	–	–	–	+	+
38	M.	6	47	2	–	+	+	..	..
39	M.	12	28	2	–	+	+	..	..
40	M.	8	24	3	–	–	+	..	..
41	M.	6	23	2	–	+	+	..	..
43	F.	11	40	1	–	–	+	..	..
44	M.	14	49	2	–	+	+	..	..
45	M.	6	32	3	–	+	+	..	..
48	M.	9	24	2	–	+	+	..	..
49	M.	7	33	1	+	+	+	..	..
51	F.	11	44	2	–	+	+	..	..
53	M.	5	36	2	+	+	+	..	..
55	M.	4	42	2	+	+	+	..	..

A particular specimen of toxin prepared in the way just referred to was then used for intradermal test on a large number of individuals [2] each of whom was submitted not to one dose of toxin but to a small series of graduated dilutions. The advantage of this multiple dose titration lies in that it gives information not only that an individual may be resistant to one particular dose of toxin, as does the ordinary Dick test, but that it also affords a rough measure of the degree of resistance of that individual and assigns to him a position on an immunity scale. The method, therefore, has enabled us to classify individuals as coming into one or another of a series of "immunity groups." Those who react positively to the smallest amount of toxin in the scale of titration—viz., 1 unit—are the most susceptible and are said to belong to Group VI., whereas those who react negatively to 16 units are the most resistant of all and are aggregated in Group I.

Such a classification, resting as it does on the hypothesis that the degree of reaction to the toxin affords an index of the degree of immunity, is justified only if the assumption is proved to be correct. That this is so we were able to show in our previous report, for we found that the blood of four susceptible individuals contained little or no antitoxin, whereas the blood of four resistant individuals contained antitoxin in considerable amounts.

The present report concerns itself with an amplification of these last-mentioned experiments and deals with an attempt to determine the antitoxin content of a series of 40 specimens of blood, collected in the Birmingham City fever hospitals, half being taken from children who were convalescent from scarlet fever, the other half from children in whom there was, as far as could be ascertained, no previous history of this disease. Toxin reactions had not been done on these children, so that there is no evidence from this source to correlate with our observations. There was no selection of cases except in so far as to exclude (1) adults, and (2) children in which the diagnosis was doubtful on clinical grounds.

TABLE B.—*Non-Scarlet Fever Children.*

A.S. = Amounts of serum titrated against five skin test doses.

Number.	Sex and age.	Blood-group.	A.S.				Number.	Sex and age.	Blood-group.	A.S.			
			0·1	0·04	0·02	0·01 0·004				0·1	0·04	0·02	0·01 0·004
9	M. 8	2	+	+	+	..	20	F. 9	4	+	+	+	..
10	M. 11	1	–	–	–	+	21	F. 9	1	+	+	+	..
11	M. 6	2	–	+	+	..	22	F. 7	1	+	+	+	..
12	M. 11	2	–	+	+	..	23	F. 12	2	+	+	+	..
13	M. 10	1	+	+	+	..	24	F. 8	1	+	+	+	..
14	F. 14	2	+	+	+	..	32	F. 11	1	+	+	+	..
15	M. 11	1	–	+	+	..	33	F. 10	1	–	–	+	..
16	M. 5	1	–	+	+	..	34	F. 8	1	+	+	+	..
17	M. 11	3	+	+	+	..	35	F. 12	2	+	+	+	..
19	F. 10	1	–	–	+	..	37	M. 7	1	–	+	+	..

Technique.

To the serum separated from clotted blood by centrifuging there was added trikresol in the proportion of 0·35 per cent. Each sample, placed in a rubber-corked tube, was then stored in the cold room for three to ten days before use. Toxin-antitoxin mixtures were made by adding 0·5 c.cm. of toxin containing 25 skin test doses (or 50 units) to 0·5 c.cm. of serum in a series of dilutions. The specimen of toxin employed was the same as that used in previously recorded experiments.[2] The amounts of serum in each total mixture of 1·0 c.cm. were as follows: 0·5, 0·2, 0·1, 0·05, and 0·02 c.cm. The mixtures were made up and kept at 37° C. for one hour immediately before use. The actual dose of each mixture used for intradermal inoculation amounted to 0·2 c.cm., so that it consisted of five skin test doses of toxin mixed with one-fifth of the volume of serum just mentioned.

As there is not yet a satisfactory animal test for the estimation of the toxin of *Streptococcus scarlatinæ*,

[1] Henry, H., Lewis, F. C., and Others: On the Toxin of *Streptococcus Scarlatinæ*, THE LANCET, 1925, i., 710.
[2] Henry, H., and Lewis, F. C.: On Immunity to the Toxin of *Streptococcus Scarlatinæ*, THE LANCET, 1925, ii., 587.

(*Continued from previous page.*)

DR. WOLF AND MR. CANNEY: REFERENCES.

Weiland: Pflüger's Archiv, 1912, cxlvii., 171.
Le Heux: Pflüger's Archiv, 1918, clxxiii., 3.
Hunt and Taveau: U.S. Public Health and Marine Hospital Service, 1911, Bull. 73.
Dale: Jour. Pharmacol. and Exper. Therapeutics, 1914, vi., 146.
Magnus: Die Naturwissenschaften, 1920, Heft 20.
Aral: Pflüger's Archiv, 1922, cxciii., 359; Archiv f. Exper. Pathol. u. Pharmakol., 1922, xciv., 149.
Le Heux: Archiv der Pharmazie, 1924, Heft 6.
Klee and Grossmann: Verhandlungen der Kongress f. innere Medizin, 1923.

recourse must be had to human skin. The only human individuals possessing skin suitable for the test are those who are sensitive to small amounts of toxin—i.e., those who are classified together in Groups V. and VI. These comprise the bulk of children of junior school age who have not had scarlet fever and a small proportion of ordinary adult males and females. There are many reasons why this large series of tests should not be carried out on children, and we were fortunate in having at our disposal an adult male who was eager that we should use him as much as we should consider necessary. This lucky circumstance we gladly seized upon, as it gave us the opportunity of estimating in a short space of time the antitoxic titre of the 40 sera, and, moreover, it afforded us strictly comparable findings as between one serum and any other throughout the whole series, a result which would have been unattainable had use been made of a number of suitable volunteers.

The whole period taken up by the inoculations occupied 14 days, a batch of five to ten sera being given at one time and followed by one or two days of rest. Readings were taken 24 hours after inoculation, and are recorded as follows:—

+ = a reaction equal to or larger in area than that covered by one skin test dose.

− = no reaction, or a reaction smaller than that caused by one skin test dose.

Except for slight dissociation in the case of the first five sera to be tested, no difficulty was experienced in reading reactions until we reached the last quarter of the series. Then it became apparent that the individual whom we were inoculating was reacting to some constituent of the toxin other than the toxin itself. A series of tests showed him to be sensitive to rabbit serum and also to some ingredient of the condensation water taken from salt agar tubes which contained no peptone or meat extract. The combination of these two factors resulted in the production of what may be termed a pseudo-reaction which tended to mask the negative reactions and also to emphasise the positive ones. It would appear, therefore, that an increased susceptibility to a pseudo-reaction must be borne in mind in interpreting the results of a large series of inoculations in any one individual. In this particular instance the reactions obtained at the end of the series were still readable, though with difficulty, and we do not feel that the individual could be profitably used for further injections of a similar character until he has lost his sensitiveness.

Results.

The findings in respect of the reactions in individual scarlet and non-scarlet children are set out in Tables A and B respectively. The results show that the differentiation between these two groups in regard to their antitoxin content is as follows:—

1. If the unit of antitoxin be taken as that amount which gives complete neutralisation of one skin test dose, then out of 20 scarlet fever children 17 were found to yield a serum which contained 50 units or more of antitoxin, whereas of the non-scarlet children only eight reached this titre. 2. Of the 20 scarlet children nine yielded a serum containing 125 units or more, whereas only three of the non-scarlet children did so. 3. The 250 unit level was reached by five scarlet children and by one non-scarlet child.

The blood groupings of these children were determined for a purpose other than that with which the present report concerns itself. It is of some interest, however, to note that, although the distribution of the groups taken throughout the whole collection of sera approximates the normal, yet there would seem to be a preponderance of Group II. individuals among the scarlet fever convalescent children and of Group I. individuals in the non-scarlet series.

Our best thanks are due to Dr. E. H. R. Harries for the supply of bloods.

HERPES ZOSTER OTICUS AND ALLIED CONDITIONS,

WITH NOTES OF THREE CASES.

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HON. LARYNGOLOGIST TO THE LIVERPOOL ROYAL INFIRMARY; HON. LECTURER IN LARYNGOLOGY, LIVERPOOL UNIVERSITY.

Herpes zoster of the skin of the auricle was described and figured many years ago. In the second edition of Gruber's book on the ear, published in 1890, mention is made of its association with nerve deafness, while Politzer, in the fourth edition of his text-book (1902), refers to facial palsy as yet another feature of some of these cases. But the credit for the first complete description of the interesting syndrome, known to-day as herpes zoster oticus, is due to J. Ramsay Hunt, to whose writings I am indebted for much of what follows. In 1907 and 1908 he gave a detailed account of the disease and its complications based on four cases observed by himself, together with 56 others collected from the literature.

It is well known that herpes zoster affecting an area on the trunk or limbs is due to an inflammation of one or more of the ganglia of the posterior or sensory roots of the spinal nerves. These ganglia contain cells of the unipolar type, and with the sensory or afferent portion of certain of the cranial nerves are associated ganglia containing similar unipolar cells, and clearly representing posterior root ganglia. One of these is the geniculate ganglion of the facial nerve. This ganglion receives its afferent fibres from the sensory portion of the nerve which consists not only of the chorda tympani, but also of fibres from a certain well-defined area of skin. These are incorporated in the auriculo-temporal branch of the third division of the fifth nerve and in the auricular branch of the vagus, and reach the ganglion through its connexions with these nerves.

The area of skin affected by herpetic inflammation of the geniculate ganglion is intercalated between the areas affected in herpes occipito-collaris and in herpes facialis, which are due respectively to disease of the upper cervical and of the Gasserian ganglia. The vesicular eruption is limited to "a cone-shaped area with its apex on the tympanic membrane and its base of the auricle" (Hunt), consisting of the tympanic membrane, external auditory meatus, concha, tragus, antitragus, lobe (outer surface), antihelix, and fossa antihelicis.

As the motor fibres of the facial nerve are closely applied to the ganglion the inflammatory process readily spreads to these, and the result is facial paralysis, which was noted in all the cases of herpes zoster oticus collected by Ramsay Hunt. Often the inflammation extends further and affects both the cochlear and the vestibular portions of the eighth nerve, causing nerve deafness, tinnitus, vertigo, and vomiting. This occurred in 19 of Hunt's cases. Moreover, just as in herpetic inflammation of the spinal ganglia, while one ganglion is chiefly affected, those on either side of it tend to suffer in a less degree, so in certain cases, presenting some or all of the ordinary features of geniculate ganglion disease, there may be also indications of coincident herpetic inflammation of other ganglia, such as the Gasserian or the second, third, and fourth spinal ganglia. It is probable indeed that occasionally the eighth nerve ganglia of Corti and Scarpa are *directly* affected, since these ganglia are developmentally homologous with posterior root ganglia. The resulting symptoms (deafness, vertigo, &c.) will then be clinically indistinguishable from those met with in typical cases of herpes zoster oticus in which the *trunk* of the eighth nerve is affected by inflammation spreading from the geniculate ganglion. In this way are probably to be

explained certain cases of herpes occipito-collaris and herpes facialis with eighth nerve symptoms, but without geniculate ganglion involvement.

Herpes zoster oticus is a rare condition. It is met with in about 1 in 20,000 cases of ear disease. Pain about the pinna and mastoid region may be severe and may be present for two or three days before the eruption appears. It was the first symptom in one of my cases, and in another was preceded by the vertigo. It is sometimes present also in the distribution of the upper cervical and the fifth nerves, due to coincident inflammation of the corresponding ganglia, or in the case of the fifth nerve to its connexion with the geniculate ganglion through the great and small superficial petrosal nerves.

As the eruption affects the tympanic membrane and skin of the meatus as well as the pinna, there may be, two or three days after it has appeared, much inflammatory swelling of the meatal walls with otorrhœa and sometimes secondary swelling of the mastoid lymphatic gland. These appearances, together with the intense pain, deafness, facial palsy, and sometimes pyrexia, are very suggestive of acute otitis media with mastoiditis, for which cases of herpes zoster oticus are occasionally mistaken. Points of importance in the diagnosis are (1) the nature and distribution of the eruption; (2) the type of the deafness—namely, inner- and not middle-ear deafness; (3) loss of taste in the corresponding side of the tongue, owing to affection of the chorda tympani nerve; (4) absence of perforation of the tympanic membrane, although its appearance may be much altered by the eruption, and, in any case, an intact drum does not of course exclude disease of the middle ear.

The duration of the disease varies considerably. Some degree of neuralgic pain usually persists for two or three weeks. The facial paralysis may be evanescent, lasting only a few days, or it may disappear gradually during the course of some weeks. The same applies to the deafness and other symptoms of eighth nerve involvement. In rare cases some degree of facial palsy and nerve deafness is permanent.

Treatment consists of sedatives for the pain, the usual local applications for the herpetic eruption, and massage and electrical treatment for the paralysis if this persists.

Clinical Records.

The following are brief notes of three cases which I have observed, the first two being characteristic examples of herpes zoster oticus, and the third a case of herpes facialis with eighth nerve symptoms.

CASE 1.—A man, aged 56, whom I saw at the request of Dr. John Hay, was in bed suffering from vertigo and vomiting, which began ten days before I saw him. For eight days there had been pain in and about the left ear and a vesicular eruption had developed on the pinna. Three or four days after the onset of the pain left facial palsy had appeared. His temperature had varied between normal and 102° F. for the first three days of the illness. When I examined him he still complained of giddiness on attempting to walk, and some pain, though much less than a few days before. There was almost complete left facial paralysis, and the left concha showed an eruption consisting of crusts and drying vesicles and pustules. The meatal skin was somewhat swollen and presented the remains of a similar eruption, while the tympanic membrane was grey in colour and desquamating. The hearing of the right ear was normal, that of the left very defective. In the left ear Rinné's test was positive and much shortened, the sound of a tuning-fork on the vertex was referred to the good ear, and bone conduction was greatly diminished.

CASE 2.—A man of 28, sent to the Liverpool Royal Infirmary by Dr. G. S. Swan, of Rock Ferry. For ten days he had suffered from right-sided facial palsy (complete at first but now diminishing), vertigo with a tendency to fall and walk to the left, and deafness of the right ear. More recently he had noticed a moderate degree of pain about the ear, with tenderness and "sores" on the pinna. Examination showed incomplete right facial paralysis, a few small crusts, apparently the remains of herpetic vesicles, on the pinna, an opaque and slightly desquamating tympanic membrane, and almost complete loss of taste on the right side of the tongue. There was also marked nerve deafness of the right ear, a watch being heard on contact only, Rinné's test positive, and bone conduction for a C 128 fork 20 seconds below normal. He still complained of some vertigo and showed a tendency to stagger towards the left on attempting to walk with eyes closed.

CASE 3.—A woman of 33 had suffered four weeks before I saw her from intense pain in the right side of her face. Three days later she had a sudden attack of vertigo and vomiting and became deaf in the right ear. On the following day a vesicular rash appeared on the right side of the forehead and chin and on the right cheek. The neck and pinna were unaffected and facial palsy was completely absent. On examination there was found marked nerve deafness of the right ear with great loss of bone conduction, much lowering of the upper tone limit, and relatively good hearing for low tones. No trace of eruption was to be seen either on the tympanic membrane, the meatal skin, or the auricle. The vertigo, which had been sufficiently severe to confine the patient to bed for a fortnight, had, when I saw her, almost subsided, leaving only a sensation of unsteadiness. Six weeks later the hearing of the affected ear had undergone much improvement, but still remained somewhat below normal.

As already mentioned, Cases 1 and 2 are fairly typical examples of herpes zoster oticus, and it is easy to understand that a case such as the first of these might, on a cursory examination, be mistaken for one of acute otitis media with labyrinth complications. An error of this kind is to be avoided by a careful consideration of all the facts, and by bearing in mind the occasional occurrence of Ramsay Hunt's syndrome.

The third case, although it was not one of herpetic inflammation of the geniculate ganglion, seemed to me worthy of record because it illustrates an allied condition which is referred to by Ramsay Hunt as herpes facialis with acoustic complications. In cases of this sort the principal seat of the herpetic inflammation is in the Gasserian ganglion, to whose zone the eruption is limited, while the absence of facial palsy and of eruption in the zoster zone of the geniculate ganglion suggests that the labyrinth symptoms (deafness and vertigo) are due to herpetic inflammation of the eighth nerve ganglia of Corti and Scarpa, which are to be regarded, like the geniculate, as true posterior root ganglia.

References.—On Herpetic Inflammation of the Geniculate Ganglion: A New Syndrome and its Complications, by J. Ramsay Hunt, Journal of Nervous and Mental Diseases, February, 1907. A Further Contribution to the Herpetic Inflammations of the Geniculate Ganglion: A Syndrome Characterised by Herpes Zoster Oticus, Facialis, or Occipitalis, with Facial Palsy and Auditory Symptoms, by the same Author, American Journal of Medical Science, August, 1908.

MANCHESTER HOSPITALS.—At the annual meeting of the Manchester and Salford Hospital for Skin Diseases, held on March 17th, it was stated that the hospital did not receive adequate support from towns outside its own immediate area. During the past year the number of patients from Manchester was only 49 per cent. of the total, and the number from Salford 15 per cent., the remaining 36 per cent. coming from outside towns. From Ashton-under-Lyne there came 733 patients, from Bolton 851, from Oldham 939, from Stretford 1074, and from Stockport 1265. Nearly all the private subscriptions, however, came from Manchester. Patients came from 430 towns and villages, but the amount of private subscriptions that came from these towns and villages was very small.—A new nurses' home which has cost £45,354 was formally opened on March 17th in connexion with the Hope Hospital, Salford. At the hospital the accommodation of all kinds has been more than trebled. There are now 258 bedrooms instead of 72, and 25 public and private sitting-rooms instead of 5. During the war the nursing staff was 78 in number; now it is 158. Up to 1920 the staff worked 70 and 80 hours a week. They now work an eight-hour day.—Owing to the inadequacy of the premises of the Manchester Northern Hospital for Women and Children, a public meeting was held on March 16th in support of an appeal for £150,000 to build a new hospital. A site has been given by Sir Edward Holt in Cheetham Hill-road. What it is proposed to erect is a building which will accommodate 200 beds and cots, for an out-patient department, and a nurses' home. Up to the present £31,920, which sum includes £16,239 from the general fund, has been subscribed.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF MEDICINE.

A MEETING of this Section took place on March 23rd, Dr. HUGH THURSFIELD, the President of the Section, occupying the chair.

MODERN METHODS OF CONTROLLING INFECTIOUS DISEASE.

Sir JOHN ROBERTSON (Birmingham) read a paper on this subject, which was supplemented by charts and diagrams. His purpose, he said, was to deal with certain general principles, leaving matters of detail aside. Some of the newer methods for controlling these diseases had been but little tried, and hence were not yet ripe for general discussion. No two infectious diseases could be successfully dealt with, from the preventive standpoint, by identical methods, but there was a tendency towards a different belief. The better the knowledge of the natural history of a disease the more efficient was its control likely to be. And the present higher standard of intelligence in the general community on these subjects was a favourable factor in keeping down infectious disease. The mortality from various infectious diseases in this country had shown an enormous decline; the small-pox mortality had practically vanished, enteric fever in most districts was practically unknown, so that it was difficult to get a case of it to demonstrate to students, while the mortality of scarlet fever was now a vanishing quantity. In regard to the incidence of the last named, however, there appeared to be very little reduction, though there were a number of factors which militated against correct incidence figures being obtained. The diphtheria mortality curve had gone down very much indeed. Measles showed a fairly high mortality in the first 25 years of the half century, but since then the mortality had gone down. Whooping-cough had not had special means of control applied to it, yet the mortality had gone down in a wonderful way. Also the death-rate of the composite condition classed as bronchitis had largely declined. Pneumonia, on the other hand, showed little reduction in mortality. The acute condition influenza did not seem to have been checked by any control measures. As to possible causes for the improved returns in most of the diseases, he did not doubt that the type of disease was now milder, and because of that all the cases might not have been diagnosed. The rate of infection among young children could not now be so great as formerly because the proportion of young children in any British population was now less than 50 years ago. Of every 1000 population in 1871, 361 were children under 15 years of age, whereas in 1921 there were only 277 children under 15, a difference of 84 per 1000.

In the past, four methods had been applied in the attempts to control infectious diseases—notification, isolation, quarantine, and disinfection. Within recent years to these had been added immunology. Each disease responded in a different way. The best results ever obtained in the prevention of any infectious disease were those which followed the active immunity caused by vaccination against small-pox. But when only 30 per cent. of the population were vaccinated and a number were but imperfectly protected by vaccination it was necessary to bring into operation isolation and quarantine. These were very satisfactory if carried out with intelligence and vigour. The difficulty at present was that a number of cases of small-pox were so mild that they escaped notification. There appeared to be very little immunity in small-pox—i.e., few unprotected people escaped the disease when exposed to the infection. The virus of small-pox was easily killed by exposure to light and air, but was capable of remaining virulent a long time when shut into an enclosed space. In this connexion he related the case in which a book belonging to a small-pox patient (who died) was handed round to relatives 13 months later, and the disease then broke out in three separate houses into which the book was taken. Scarlet fever was in a different category in regard to immunity, for natural immunity played a definite part in limiting the number of cases, and Sir John Robertson considered it also had much to do with reducing its virulence. If perfect bed isolation could be ensured he thought scarlet fever could be treated in the wards of a general hospital without fear of infecting other patients. The "Dick" positives numbered 70 per cent. in young children, and the proportion gradually fell with advancing years, until at 20 years it was only 11 per cent. Among adults who had had the disease earlier in life only 3·9 per cent. were Dick-positive. With regard to the active immunisation of people against scarlet fever, experience was not yet sufficient to warrant its general use as a preventive measure. Much good work was, however, being done in this direction, and he did not doubt it would be possible for any medical practitioner at a future date to protect any individual against an attack of scarlet fever. Isolation had not limited the spread of the disease; indeed, as a means of control, isolation was of little value to the community. Still, it was a great convenience and of value to the public. The disadvantage was that, unless the discipline in the fever hospital was really good, the patients were apt to contract from other patients infections other than their own. The proportion of immune persons was largest where the population was densest, and the explanation was considered to be that they were gradually immunised by the widespread infection. Certainly spread of the disease was most rapid in sparsely populated areas. It was not yet sufficiently realised that nose, throat and ear secretions were a potent source of infection. In Birmingham the mortality from scarlet fever was now 1·09 per cent. At present reliance was placed on the old methods of isolation and disinfection, but there was reason to hope that the work now being done on the subject would produce a satisfactory method of limiting, by immunisation, the incidence of this disease.

In regard to diphtheria, hospital disinfection and isolation had apparently accomplished nothing in reducing the incidence rate, but in Britain the mortality had been greatly reduced; 30 years ago it was 30 per cent. in Birmingham, now the figure was about 5 per cent. The most severe cases of diphtheria should be removed to hospital for skilled medical supervision and nursing, though not with the expectation of preventing the spread of the disease. This spread was brought about by carriers, who could be divided into virulent and non-virulent. The virulent were further divisible into those who were carriers for a short time and those who could be regarded as chronic carriers, many of whom had diseased tonsils, often in association with adenoids. The laryngologist's aid should be sought for these. Some people seemed to have a natural immunity against diphtheria. New York statistics gave 93 per cent. of positive Schick reactions among infants under 1 year, and here again, as in scarlet fever, there was a progressive diminution in the proportion of positives as age advanced. Active immunisation of young children would probably reduce the incidence of diphtheria practically to nil. The immunisation of 38,000 in America reduced the deaths from 1500 per annum to 663. The use of a toxoid plus antitoxin would protect a child, certainly past its period of greatest danger. It was now a safe method, and it reduced the risk of infection by about 70 to 90 per cent. The difficulty associated with the use of the immunisation method in this country was the rooted objection of the people to inoculations of any kind.

Tuberculosis showed a great reduction in mortality, and in the areas where propaganda work was active the incidence rate of the disease had fallen wonderfully. In Birmingham it was now half what it was 10 or 15 years ago. Concerning measles, little had been done in the way of preventing outbreaks of this disease from spreading. In Paris a system of immunising children in public dispensaries had given, according to

the claims of the staff, very fine results. Isolation had probably been of some help in the enteric group of diseases, but he attributed the diminution mainly to mass sanitary measures, such as the provision of uncontaminated water, the removal and destruction of refuse heaps, &c. He raised the question whether a general cause was not at work, such as a gradual immunisation of the people, to account for the milder type of diseases, the lowered mortality, and, in many instances, the lessened incidence rate. Disinfection of rooms inhabited by patients by burning sulphur or by liberating chlorine gas was no longer necessary; if everything used and the room were thoroughly cleansed nothing further seemed to be called for.

Discussion.

Dr. C. R. BOX agreed that there were no stereotyped methods applicable to the prevention of all infectious diseases. It was only by increasing knowledge of the nature and cause of disease and the manner of its spread, as well as of the problems of bodily defence, that success in this campaign could be hoped for. This success would be greatly helped by the spread of knowledge among the general public, and it would materially lessen their objection to inoculations. He suggested that immunity was set up by a heavy dose of infection calling forth the defensive mechanism of the body. He considered that the scarlatinal carrier was a very important person. Sir John Broadbent had recorded the case of a boy who had no symptoms, but who left scarlet fever in his wake wherever he went. The infection in this disease, he agreed, was spread by discharges from the ear, nose and throat.

Dr. E. W. GOODALL said that to talk of controlling infectious disease was to speak loosely. One did not control the disease; what were controlled were the actions and the circumstances surrounding the sufferer from the disease. Efforts, proved to be futile, had been directed against the micro-organism, to the neglect of other methods, for there was a tendency to consider not only that the microbe was the cause of the disease, but that it was the disease itself. Only in the case of diphtheria had the mortality been diminished by therapeutic measures. In regard to the death-rate from pneumonia and influenza there was little cause for satisfaction. The decrease in the scarlet fever mortality he attributed to a lessened virulence. He pleaded for a continuous close study of the natural history of these diseases as affording the most hope for improvement, as bacteriology had not been of so much help as was expected. Of all the measures adopted he thought the most important was that of rendering ourselves immune from attack. In the case of measles, this had not been done in England by obtaining blood serum from the measles patient, and it might prove a somewhat formidable proposition, seeing that it required the serum of about 300 children to immunise 2000 to 3000 children. Vaccination against small-pox was largely falling into abeyance, and the hopes in regard to protection by immunisation on a large scale were not at all bright. The toxin-antitoxin method, applied on a small scale, had been shown to be of great value.

Dr. R. A. O'BRIEN directed attention briefly to a discussion of controlled and uncontrolled immunisation in diphtheria. He said that he and his colleagues had had under observation, in four years, three residential institutions in which a good deal of diphtheria had occurred. All the children were tested and immunised, and kept immunised, and during those four years there had been no case of clinical diphtheria among them, though they were exposed to the risks of infection. In one school there was a large outbreak of the disease, a case of uncontrolled incidence. This was followed by a period of immunity, and it had been found that the importation of fresh residents was a menace unless they were subjected to the same process. He considered that efforts should be made to immunise the nursing and other staffs of the fever hospitals of the country, as the dislocation of duties through illness was a serious matter, besides being a source of economic loss.

Major G. S. PARKINSON, R.A.M.C., spoke of the experiences in relation to infectious disease during the war, and the effective way in which typhoid was checked by inoculations. At one period in the early stages of the war the supply of antitetanic serum gave out, and the incidence rate of that disease at once rose, to be as quickly brought down when a fresh supply arrived. During a campaign the men were under strict control, hence results could be very definitely ascertained, whereas in civil life public opinion was often an obstacle to efficient control and treatment. Gibraltar afforded a good example of control. Everyone there was vaccinated against small-pox, and no case of that disease occurred there, though it was prevalent in Spain and Morocco, countries with which Gibraltar was in constant communication.

The PRESIDENT thought the idea of a general pool of acquired immunity was a possible explanation of the fall in the death-rate, and to a large extent of the incidence rate, too, of many infectious diseases, in which influenza did not share. A further point concerned the fall in the incidence and the death-rate from the conditions classed by the Registrar-General as bronchitis. This was largely due to better general social conditions, and especially to regulations applied to factories by the Home Office. As an instance he could recall large numbers of cases of bronchitis coming to St. Bartholomew's Hospital from the brass-works of Clerkenwell, but since the Home Office Regulations had been in force the number of these had been very much less.

SECTION OF EPIDEMIOLOGY AND STATE MEDICINE.

AT a meeting of this Section held on March 26th, Dr. E. W. GOODALL in the chair, Prof. W. J. WILSON read a paper on

Typhoid Fever in Northern Ireland.

He began by calling attention to the great reduction of mortality from typhoid fever which had taken place, not only in the United Kingdom but in most European countries. In 1875 the rate of mortality from typhoid fever in Ireland was lower than in England and Wales; it was 1·6 per 10,000 as compared with 3·7. Between 1875 and 1886 the rate declined in England and Wales but was almost stationary in Ireland; the rates in 1886 were 1·8 in England and 1·6 in Ireland. Little change occurred in the next ten years, but since 1900 there had been a considerable decline, greater in England than in Ireland; in 1924 the rates were 0·13 for England and Wales and 0·31 for Ireland. Prof. Wilson pointed out that in Ireland the rural population was relatively much more numerous than in England and that the development of the creamery system, together with imperfect public health control, had been responsible for several outbreaks in rural areas. Passing to the special problems of Belfast, he presented statistics showing the great decline of typhoid fever in that city. The mortality-rate was 7·0 per 10,000 in 1872–75 and as high as 9·7 in 1896–1900. Since 1910 it had never reached 1·0 and in 1924 it was only 0·07. He referred to the late Dr. L. W. Darra Mair's report incriminating shell-fish, and, while expressing his admiration of that report and his belief that much typhoid in Belfast had been due to the consumption of contaminated cockles and mussels, did not think that the great decrease of recent years could be attributed wholly to a change of habit in the use of shell-fish. He attached much importance to the abolition of privies, the substitution of ashbins for ashpits, improved scavenging, abatement of nuisances, decrease of stables and byres with their concomitant flies, more effective sanitary administration, higher standard of living and education, and the growth of a sanitary conscience. The work of Greenwood and Topley on the effect of the addition of susceptible subjects to an infected population had, he thought, a bearing on the Belfast experience; the highest mortality had been during the periods of most rapid

expansion, when the increase of population was due not merely to excess of births over deaths but also to immigration. Prof. Wilson concluded his paper with an account of a series of outbreaks which had been fully studied.

His paper was discussed by Sir WILLIAM HAMER, Sir GEORGE BUCHANAN, Dr. MAJOR GREENWOOD, Dr. S. MONCKTON COPEMAN, Dr. G. C. TROTTER, Dr. J. A. ARKWRIGHT, Fleet-Surgeon W. E. HOME, and Dr. GOODALL.

LONDON ASSOCIATION OF MEDICAL WOMEN'S FEDERATION.

A MEETING was held on March 9th, Dr. CHRISTINE MURRELL, the President, being in the chair, when Miss GERTRUDE HERZFELD gave an address on the

Acute Abdomen in Childhood.

She spoke first of the differences between the pathology of this condition in adults and in children. In children the lesions were limited to the embryological mid-gut, corresponding to the small intestine and the first two-thirds of the large intestine. As to the manifestations of inflammatory or obstructive conditions, these were much more speedily noticeable in children. Inflammation proceeded to suppuration much more rapidly and obstruction soon gave rise to symptoms of toxæmia. For these reasons the practitioner should not wait to make a differential diagnosis once he was convinced of the presence of an acute condition in the abdomen, but should at once call in surgical aid. Prior to laparotomy the child should be kept warm and given plenty of fluid; subcutaneous saline injections should be administered if there had been much vomiting. It was the speaker's custom to give atropine in large doses, gr. 1/200 to 1/150, to infants under 2 before operation, and gr. 1/100 to children over 2. Warmth in the theatre, speed in operating, and gentle handling were essential to success. Only two incisions were used by her—the gridiron incision, where appendicitis or an intussusception proximal to the transverse colon was suspected, otherwise a vertical paramedian incision. Post-operative saline infusions were always given.

The conditions giving rise to an acute abdomen in childhood could be divided into inflammations and obstructions. Among the former, appendicitis (50 per cent. of all abdominal cases), pneumococcal peritonitis, streptococcal peritonitis, Meckel's diverticulitis, and tuberculous abdomen had to be considered. Congenital obstructions to be looked for included imperforate anus, congenital hypertrophy of pylorus, maldevelopment of gut, bands, and Meckel's diverticulum. Acquired obstructions might be due to intussusception (20 per cent. of abdominal cases in childhood), tuberculous peritonitis, hernia, or volvulus. She discussed in some detail acute appendicitis and intussusception as being relatively common conditions, and gave an account of recent investigations into the rare condition of pneumococcal peritonitis.

Acute appendicitis could occur at any age, but generally the patient was over 2 years. It was rarely diagnosed before suppuration supervened; over 90 per cent. of Miss Herzfeld's cases were already suppurating at operation. She had found pus as early as within 12 hours of the first attack. Vomiting was almost invariable except where the appendix was in the pelvis, in which case pain might be localised at the umbilicus in the young child, or in the suprapubic region in the older one. There might be frequent and painful micturition through involvement of the bladder, or diarrhœa. There was little rigidity of the abdominal wall, but on rectal examination tenderness was found not only during insertion of the finger, which was usual in normal children, but on movement of the finger-tip in certain directions. The feature of inflammation of a retrocæcal appendix was a lack of resistance in the abdomen associated with posterior rigidity in the region of the lumbar muscles; vomiting might occur. If the appendix was associated with an undescended cæcum the rigidity and tenderness were to be found higher up in the abdomen.

The differential diagnosis of appendicitis from diaphragmatic pleurisy and pleuro-pneumonia could be very difficult. In the last-named condition the rigidity and tenderness were not so well marked nor so persistent as in appendicitis. Sometimes re-examination some 20 minutes after the first examination revealed a shifting of the signs to another place. The general appearance of a child with pneumonia was characteristic. Acute and subacute pyelitis could be differentiated from appendicitis by a microscopic examination of the urine, which was usually acid, and by the presence of lumbar tenderness. In ileo-cæcal tuberculosis abdominal tenderness was very marked, but rigidity less so, and the child, on the whole, was not so ill. This condition might be very difficult to differentiate from appendicitis and in doubtful cases it was better to explore. The possibility of cyclic vomiting must be borne in mind and excluded, since an anæsthetic was injurious in this condition. The history of vomiting previous to the attack and the presence of acetonuria were diagnostic features.

Pneumococcal peritonitis was a rare condition, but the mortality was high (70 to 75 per cent.) irrespective of treatment; it could be primary (so-called idiopathic) or secondary to pneumonia or some other lesion. The primary form was of especial interest, as its pathology had only been worked out by Prof. J. Fraser and Dr. J. E. Macartney of recent years in Edinburgh. It occurred only in little girls of the hospital class, the average age being 5¼. It began as a pelvic peritonitis and was an ascending infection, through the vagina, in children who had a vaginal discharge. The class incidence might be accounted for by the inadequate clothing and the habit, among the poorer children, of sitting on dirty steps. A septicæmia rapidly followed the peritonitis, with a positive blood culture in 6 to 12 hours. Experimental work on rabbits had enabled the course of infection to be traced and had proved that the blood infection was a secondary one. The child suddenly complained of acute abdominal pain, followed by vomiting, delirium, and high temperature. In the less acute cases the septicæmia might be delayed for 48 hours. The only possible treatment was drainage of the lower abdomen. Blood transfusion had not proved of much avail.

Intussusception.—The typical features were onset of acute abdominal pain in a fat, strong, healthy baby, usually a boy, over 4 months of age. The usual history was that the child screamed and drew up his legs, then "fainted away," and, exhausted, fell asleep, only to awake half an hour later with another attack; vomiting would begin at this stage, and sooner or later blood would be passed per rectum. Since the contents of the bowel distal to the ileo-cæcal region had first to be emptied, blood was not necessarily passed at once. Miss Herzfeld quoted cases to show the difficulty of diagnosis even when blood was passed. It was unwise to operate unless the tumours could actually be felt under anæsthesia. If the patient was under a year old reduction alone should be performed at operation, for any mutilation at the time was not well borne by the infant.

Dr. HAZEL GREGORY pointed out that in children rigors, if present, were pathognomonic of acute *B. coli* pyelitis.

Miss L. MARTINDALE described a fatal case of pneumococcal peritonitis in a child of 5. The child was not of the hospital class, but had previously been brought for advice for vaginal discharge and masturbation.

LONDON CLINICAL SOCIETY.

THIS Society held a clinical evening at the London Temperance Hospital on March 18th, Mr. HERBERT J. PATERSON, the President, in the chair.

The PRESIDENT showed a man who is undergoing a series of plastic operations to replace a nose destroyed

by lupus. He also showed a series of radiograms illustrating an unusual site for gastric ulcer, where the clinical diagnosis was only confirmed by taking lateral views after antero-posterior exposures had proved negative.

Dr. FLEETWOOD WALKER showed a man who two days before, on the advice of a friend, had taken a teaspoonful (repeated four hours later) of the following mixture to cure a cough: 1 eggcupful of resin powdered, 1 eggcupful of honey, 2 tablespoonfuls of vinegar. On taking the second dose he came out in a generalised punctate scarlatiniform rash which still persisted. On the following morning his face was puffed. The urine showed the presence of resinous bodies when treated with nitric acid.

Mr. H. P. WINSBURY WHITE showed: (1) A colour drawing of malignant disease of the kidney. (2) A specimen of kidney with large stone (with X ray photographs by Mr. J. C. Macduff). The chief interest in the case was that the patient had for several years had renal symptoms on the opposite side, which had helped to mask the diagnosis. (3) Specimens of large stones removed from the bladder of a woman, aged 32, who had had two Cæsarean sections. The patient had also passed ligatures per urethram. During the discussion Mr. White said that he would give no expression of opinion as to whether catgut ligatures should be used in Cæsarean sections, although aware that over 90 per cent. of cases of ruptured uterus occurred in cases in which catgut had been used.

Dr. HAROLD SANGUINETTI showed: (1) A specimen of a strangulated inguinal hernia from an infant aged 4 months. The child was admitted to hospital as a case of broncho-pneumonia and died after a few hours. The condition was only found on post-mortem examination. (2) A specimen of stenosis of the duodenum in an infant. The child was admitted to hospital because the mother said it was not passing any urine. The condition was discovered post mortem. (3) A specimen of kidneys, ureters, and bladder in a case of bilateral renal calculi in a woman who developed bacilluria after an operation for carcinoma of the breast.

Dr. PHILIP FIGDOR showed a single woman, aged 28, who had complained of stiffness and pain in the left knee, which had commenced one month after she knocked her knee against an iron bar in October last. The knee was swollen, the synovial fluid was increased, and all movements were painful. She gave a history of night sweats for the past four months and also a strong tuberculous family history. The X rays showed some indefinite patellar changes. The intradermal tuberculin test was strongly positive, while the Wassermann was also strongly positive. The case was probably one of syphilitic arthritis. She was having auto-syphilitic treatment as well as ionisation locally.

MANCHESTER MEDICAL SOCIETY AND LIVERPOOL MEDICAL INSTITUTION.

AT a joint meeting of the Manchester Medical Society and Liverpool Medical Institution held at Manchester on March 3rd, Prof. A. H. BURGESS, the President of the Manchester Medical Society, took the chair, and Mr. R. C. DUN (Liverpool) read a paper on

Chronic Intussusception.

This condition, he said, was much less common than acute intussusception; it occurred in older children, and there was a larger proportion of the enteric and colic forms; the sexes were equally affected. The symptoms were slight, indefinite, intermittent, and prolonged. In his 13 cases they had been present for periods ranging from four weeks up to two and a half years. Umbilical pain was usually slight and colicky; vomiting was occasional and concurrent with the attacks of pain; constipation was not marked, and there was always a deterioration in health. An abdominal tumour was felt in 9 out of the 13 cases; it was intermittently present, appearing and disappearing with the pain, and in two cases only was it long enough to be called sausage-shaped. Blood and mucus in the stools was only noticed in two of the cases, and in both of these it was intermittent. Diagnosis was difficult owing to the evanescence of the abdominal tumour, and it was important to make frequent examinations, especially during the attacks of pain, so as not to miss this sign. In no case had the intussusception progressed far enough to cause acute intestinal obstruction.

The treatment, said Mr. Dun, had been laparotomy and reduction in all cases. This had always been easy; no adhesions had ever been found, and there had been practically no œdema. In none of his 13 cases did the symptoms recur after operation. No obvious pathological condition had been met with in any of the cases which could account for the intussusception.

Cysts of the Semilunar Cartilage.

Mr. T. P. MCMURRAY (Liverpool) reported eight cases. Unlike those previously reported, three of them were in connexion with the internal semilunar cartilage; the 18 cases previously reported had all been associated with the external cartilage. The cysts were multilocular, contained clear fluid, and required excision for the cure of the symptoms. Two of them had already been operated on by other surgeons, when the cysts alone had been removed with no relief of the symptoms. In all the eight cases the affected cartilage was removed with the cyst and a complete cure resulted. Microscopical examination of the cyst wall showed that it was lined with compressed cartilage cells and intercellular strands with darkly staining nuclei, but no trace of endothelium or epithelium. Blood-vessels were seen on the outside of the cysts, but not to the same extent as between the cysts. From the presence and from the position of the blood-vessels connected with the cysts, it was concluded that the cysts were traumatic in origin, and of the nature of degenerate change.

The Purgative Action of Magnesium Salts.

Dr. HENRY COHEN (Liverpool), who read a paper on this subject, pointed out that there were two main theories about the mode of action of the saline purgatives. The first was that their action is entirely local—i.e., exerted solely from the lumen of the intestine. The second was, on the contrary, that the saline purgatives do not act from the lumen of the gut, but only after the absorption of the cathartic ion. The evidence adduced in favour of one or other theory had, up to the present, been too conflicting to justify definite conclusions. Using a special method for the estimation of magnesium in small quantities of serum, Dr. Cohen found that the oral administration of purgative doses of $MgSO_4$ (20–30 g.) was—within the limits of experimental error—unaccompanied by any alteration in the magnesium content of the serum. On the other hand, intramuscular injection of magnesium sulphate in solution (18–20 c.cm. of 10 per cent. aqueous soolution) was followed by considerable increase (50–100 per cent.) in the magnesium content of the serum; but in no case was this rise accompanied by the characteristic purgative effect of the salt when given by the mouth. Following a purgative dose of $MgCl_2$ there was a rise in the magnesium content of the serum. This rise was, however, no higher and no less rapid than that following intramuscular injection of $MgSO_4$. Since the latter did not cause purgation, it followed that the purgative action of magnesium salts was exerted independently of the absorption of magnesium into the blood. Dr. Cohen exhibited radiograms showing that, in the same individual, a purgative dose of magnesium sulphate increased the rate of passage of an opaque meal along the intestine and also the bulk of the intestinal contents. Moreover, when the lower bowel was empty before the experiment, the first stool passed after administration of

the purgative salt contained bismuth. Dr. Cohen concluded from the two sets of data he had presented that the purgative action of magnesium salts is entirely local and is independent of the absorption of magnesium into the blood stream.

LIVERPOOL MEDICAL INSTITUTION.

AT a meeting of this Institution on March 18th Mr. G. C. E. SIMPSON read a paper on

Acute Appendicitis.

From the Registrar-General's reports, checked by his knowledge of a small town where he could trace most of the cases of acute appendicitis in the last five years, he had come to the conclusion that the incidence of the disease was about 1 case per 1000 of population per annum, with a mortality in cases treated surgically of about 6 per cent. Cases treated throughout on medical lines (Osler's Medicine, 1901) had a mortality of 14 per cent. He suggested that this would be reduced to less than half if the general peritonitis and abscess cases were submitted to immediate operation and the rest treated on medical lines. The present mortality of the surgical treatment was too high, and the careful choice of the time of operation in later cases would give a reduction, apart from the reduction to be effected by earlier diagnosis. Mr. Simpson quoted from recent writings of Sherren and Adams in favour of delay, and of Burgess and Grey Turner in favour of immediate operation. He professed himself a follower of the St. Thomas's School. Operating at once on all cases seen in the first two days, on cases seen later which were advancing, and as a rule in all children, he used the Ochsner method in doubtful or subsiding cases seen on the third day or later, and operated when they had subsided; these cases, however, must be kept under close observation, and interference undertaken at once if signs of progression were seen.

On these lines Mr. Simpson's mortality in the Northern Hospital in the last five years was only 2·5 per cent. Adding the figures from the cottage hospital in the small town referred to, it was 3·5 per cent. (and in that town the main mortality was in the first year). In the 15 per cent. of his cases in which delay was practised (45 in all) only six failed to settle. (In five abscess required opening, and in one gangrene caused the advance.) And at the subsequent operation no drain was used in 33, although in several there were signs of gangrene, perforation, or abscess, and, in a few, fistula into the intestine. No case died, but in one of the cases of acute abscess a fistula required treatment. Four other cases operated on by Mr. Simpson had fistulæ, and in all of them tubercle was present. Mesenteric or peritoneal tubercle was marked in 5 per cent. of the cases and caseating glands were removed in a number. One case with tuberculous appendicitis and glands died of tuberculous pneumonia.

Mr. Simpson concluded that the mortality of acute appendicitis could be lowered by judicious choice of the time to operate in cases not seen before the third day, but emphasised the need for the cases to be under strict observation and regulation. He considered that this would lead to all suspect cases of appendicitis being kept in the Fowler position and on water only while waiting the advent of the surgeon, and that this, and the opportunities given to students to see more of the symptoms of appendicitis through these cases being detained in the wards, would more than neutralise the ill-effects anticipated by Burgess and Grey Turner from some doctors carrying out the treatment in the wrong cases and under wrong conditions.

Dr. C. RUNDLE read a paper on the use of indicator reactions in diphtheria and scarlet fever.

Corrigendum.—In the agenda and report of the discussion on cancer held by the Society of Medical Officers of Health on March 19th, Dr. W. D. Newcomb, pathologist to St. Mary's Hospital, was wrongly described as assistant pathologist.

Reviews and Notices of Books.

TUBERCULOUS DISEASE OF THE HIP-JOINT.

Diagnosis, Treatment, and End-Results. By GEORGE PERKINS, M.Ch. Oxon., F.R.C.S. Eng., Assistant Surgeon to the Royal National Orthopædic Hospital; Orthopædic Registrar, St. Thomas's Hospital. London: Humphrey Milford, Oxford University Press. 1926. Pp. 118. 6*s*.

IN 1924 the British Orthopædic Association founded the Robert Jones prize and medal, the subject chosen for the first competitive essay being the Diagnosis, Treatment, and End-results of Tuberculous Disease of the Hip-joint. The successful monograph, by Mr. George Perkins, is now published under the auspices of the Association, and it may therefore be regarded as expressing, perhaps more accurately than any work yet issued, the trend of British surgery in regard to this often seriously crippling disease.

Early diagnosis, as might be expected, is dealt with in considerable detail, and the importance of a limp as the primary symptom is very properly emphasised. Stress is laid on the facts that pain is not usually present at the onset of the disease, and that a skiagram taken soon after the commencement of symptoms shows nothing abnormal. The section on treatment recommends recumbency with traction and immobility throughout the active stage. In the author's practice these are secured by the use of the Pyrford hip frame, a combination of the Jones's abduction and the Carshalton frames, mounted on the Carshalton carriage described in THE LANCET, 1921, i., 1071, by Dr. Gordon Pugh. All cases are fixed in full extension, the widest possible abduction, and negative rotation, on the assumption that if ankylosis occurs it will be fibrous, and that the hip will slowly tend to adduct and flex. An abscess is not interfered with unless threatening to break through the skin or causing pain; the contents are then expressed through an incision which is at once closed. In the author's opinion there is no sure sign as to the exact date when activity ceases; X rays cannot show whether the disease is still active, and clinical experience alone can guide. In the convalescent stage the aim of treatment depends on the degree of destruction. When the cartilage covering the head of the femur is intact, or when it is only in part destroyed and efficient traction has held the femur away from the acetabulum so that the intervening fibrous tissue is of sufficient length to allow movement, the treatment recommended is by patten and crutches or weight-relieving calliper. When the cartilaginous surfaces have been more seriously damaged and the bones allowed to come into apposition through inefficient traction, ankylosis has to be aimed at, the patient being allowed to walk on the affected leg for a year or two in a plaster-of-Paris spica ending above the knee.

The third section of the book, which deals with the results of treatment, is of special interest, differentiating between the end-results that may be expected in disease of the acetabulum, the femoral neck, the synovial membrane, and the head of the femur. Dislocation and subluxation, or wandering acetabulum, are declared to be avoidable and due to faulty treatment; they are serious inasmuch as they always result in an unsound hip and demand further treatment to improve the function of the limb. In the last chapter the question of primary and secondary operations is discussed and a detailed description of the Pyrford frame given.

This little volume is attractive and unusually helpful, and expresses clearly and modestly the opinions the writer has formed after careful study and discriminating observation. It is well printed and illustrated by excellent skiagrams.

ANATOMY.

Grundriss der Wissenschaftlichen Anatomie. By Dr. WILHELM LUBOSCH, Professor der Anatomie in Würzburg. Leipzig: Georg Thieme. 1925. Pp. 292.

WE have gone through this book with great pleasure. It is not a text-book of anatomy in the sense usually understood by the student, and it is more than a handbook of morphology applied to the human body. It is intended to be a companion volume to the reader's anatomical text-books, to be used with them so that the student may obtain a more comprehensive view of the science which includes within itself the details of the body on which he is working. It deals with anatomy in its relation to philosophy, medicine, physiology, and so on, proceeds to consider life and its necessities in organic structure, and thus opens the way to the special morphology of the human subject through general morphology with its many points of view. It is possible that the English student would not take kindly to disquisitions on metaphysical matters, but we would like to see such a book in his hands, not because of its new material, nor because the views are always those taught here, but because of the excellent way in which the information is put together. The facts are certainly to be found in works in our tongue, but in this work they are placed in proper sequence and the subject is treated as a whole in clear language, and often with commendable brevity. Developmental anatomy, moreover, is properly placed in the morphological scheme, although we would have liked to have seen more made of this subject in dealing with the special morphology of the human frame. A morphological consideration of the cellular constituents brings to an end a book on which Prof. Lubosch is to be congratulated.

THE SYMPTOMS OF DISEASE.

The Basis of Vital Activity. By Sir JAMES MACKENZIE. London: Faber and Gwyer. 1926. Pp. 132. 6*s*.

THROUGHOUT his pilgrimage from Burnley through London to St. Andrews, Mackenzie was at bottom concerned with one topic—the nature of symptoms. As it happened, after some concern with visceral pain, the symptoms of cardiac disease became for many years his preoccupation, and it was the success with which he followed this particular line that brought him to the great position which he deservedly held throughout the medical world. There are many workers who have followed his lead and elaborated his analysis of cardiac symptoms; they have proved beyond doubt that his methods and results in this field are sound and fruitful. And in this short statement of his general position, finished very shortly before his death, he sets out to persuade his fellows that similar methods can be applied to symptoms of any kind and that they will yield equally important results if they are pursued sincerely and with patience commensurate with the difficulty of the problem. His testament needs close reading and, indeed, it must be confessed that his meaning is not always quite clear. Symptoms are not, he says, the direct result of injuries inflicted on the body; they are produced by the body and are the manifestation of abnormal or unusual activity by some organ or tissue. Cells are always either discharging energy or renewing their supply of it; their periods of renewal can be varied considerably, and this is the way in which their activities are modified. When they are active, they exhibit their specific activity and at the same time discharge an impulse which influences other cells and produces the regulation and coördination which is characteristic of the cells of an organ and of the organs of the body. Hence permeating all bodily activities is the "reflex arc"—not, perhaps, a very happy form of words, for it gives a wide meaning to an expression which has customarily had a more limited significance. The implications of these propositions must be followed in the original and in the experience of the reader; if he concludes that they are ill-founded, he will find on the last page that the author admits that that is quite likely. But it will do everyone good to reflect as seriously as they can on the definition of a disease as "the reaction of the body to an injurious agent."

NOTABLE BRITISH TRIALS.

Trial of Abraham Thornton. Edited by Sir JOHN HALL, Bt. London and Edinburgh: Wm. Hodge and Co. 1926. Pp. 183. 10*s*. 6*d*.

THE latest volume in the series of Notable British Trials (Rex *v.* Abraham Thornton) lacks the direct medico-legal interest of its predecessor, the trial of Ronald True. But it has all the human appeal of an unsolved problem and a queer historical interest as well. In 1817, on the morning of Whit-Tuesday, the body of a girl named Mary Ashford was found in a pond near Sutton Coldfield. There was strong suspicion that Thornton had been guilty both of criminal assault and of murder. He had been with her at a village dance the previous evening and (as he himself admitted) was alone with her afterwards till 4 A.M., a few hours before her body was recovered from the pond. Footprints corresponding with Thornton's shoes were found hard by, and things looked black for him. He was found guilty of wilful murder by the coroner's jury, but, to the surprise of the countryside, was acquitted at Warwick assizes. Then, popular feeling running strongly against him, the archaic process of "appeal of murder" (already obsolete for 100 years or more) was invoked against him. Under an Act of 1486 the elder brother of the dead girl succeeded in placing him on trial afresh in Westminster Hall. But one archaism was met with another. Thornton claimed the primitive right of "trial by battel" and flung down his gage, which his prosecutor showed no wish to take up. Thornton was released a second time, but found his old home too hot for him and ended his life in America. This was the last example of an appeal of murder and a challenge of trial by battle for Parliament put an end to these absurd anachronisms in 1819.

The main medical interest of the case is the problem whether the modern expert witness would have been able to remove the doubts as to how Mary Ashford met her death. A Birmingham surgeon made a post-mortem examination, but his evidence seems strangely brief to-day. Sir John Hall, who edits the trial with skill, says there cannot be a shadow of a doubt that Thornton was innocent. It would, perhaps, be safer to say that there was at any rate insufficient evidence to the contrary.

CLINICAL DISORDERS OF THE HEART-BEAT.

Sixth edition. By Sir THOMAS LEWIS, M.D., F.R.S., D.Sc., F.R.C.P., C.B.E. London: Shaw and Sons, Ltd. 1925. Pp. 131. 8*s*. 6*d*.

IN this book Sir Thomas Lewis gives a clear and concise account of the various disturbances of the cardiac mechanism, of the manner in which these disturbances can be recognised without instrumental aid, of their prognostic significance, and of their therapeutic indications. As he points out in the preface, it is the duty of investigators to bring to the notice of those who are in a position to apply them the practical results of recent advances in knowledge, freed as far as possible from technicalities. The present volume admirably fulfils this object. The records used to illustrate the various conditions are confined to sphygmographic and polygraphic tracings. The sixth edition follows closely the lines of its predecessor, and the principal innovations it contains are in the department of treatment. In 1920, when the fifth edition was published, quinidine was a novelty in cardiac therapeutics. Since then it has been extensively employed in auricular fibrillation and in certain other disorders such as flutter, paroxysmal tachycardia, and extra-systoles. In the present

edition it is included in the therapeutic measures available for the treatment of these conditions. Reference is also made to the massive dose method of digitalis administration in heart failure with auricular fibrillation, and to the use of adrenalin in the Stokes-Adams syndrome. A new diagram is introduced which serves to bring the mechanism of auricular fibrillation more closely into line with that of flutter.

As a straightforward, up-to-date, and thoroughly practical exposition of an important aspect of cardiology this small book well deserves the universal popularity which it has earned with both practitioners and students.

NUTRITION.

Lexicon der Ernährungskunde. By Dr. E. MAYERHOFER and Dr. C. PIRQUET. Lief. 3 and 4. Vienna: Julius Springer. 1926. Pp. 337–892. G.M.12.50 and 12.

WE have received the third and fourth instalments of this enterprising work, of which the first two sections received notice in THE LANCET of Sept. 19th, 1925. The scope of the lexicon, as was then indicated, includes all subjects which are in any way connected with nutrition, human or animal. Among the longer articles contained in these two instalments are some of historical interest—e..g, on cannibalism and on the nutrition of primitive races. There are also many which bear directly on present-day questions, such as the relation of sex and nutrition, and army commissariat. The greater part of the work, as before, consists of short articles descriptive of foodstuffs and their raw materials.

JOURNALS.

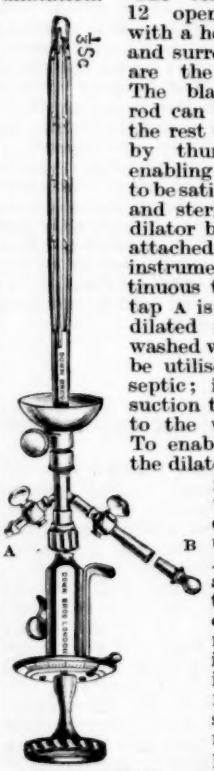
JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, February, 1926.—The laboratory investigation of dysenteries and the identification of the bacillus, if any, concerned depends crucially on the due selection and prompt forwarding of the specimen. These matters have lately been given special attention in India, with the result that, in the Poona district, in the first eight months of 1925, 90 per cent. of the cases examined were found to be bacillary, as against 9 per cent. in the first ten months of 1924, and that most were Flexner-type infections, another great difference, as we are told in a valuable, and at times entertaining, paper by Major J. A. Manifold. As a result, more cases are now treated with serum and salines, fewer with emetine. The urine being passed elsewhere, the stool is collected in a dry, clean bedpan free of antiseptic; a specimen of mucus, as free as possible from fæces, is sent to the laboratory forthwith, the time at which passed and the reaction of the mucus being stated; a film of the mucus and an emulsion thereof in neutral glycerine, 30 per cent. in normal saline, accompany the specimen. If amœbic dysentery is suspected, three fixed films of mucus are sent, and, if cysts are likely to be present, an emulsion in triple strength Gram's solution. All pathologists and others interested in such cases should read this paper for its discussion of laboratory technique, the risk of confusing with *E. histolytica* endothelial cells which have ingested red corpuscles, the inagglutinability of early Flexner cultures and other details, which they will find most helpful. Other excellent articles in this particularly good number are: Venereal Prophylaxis at Singapore, by Lieut.-Colonel P. Hope Falkner; Chloramine Treatment of Water in the Field, more effective than chlorination and without bad taste, by Major C. H. H. Harold; and Large Scale Incineration in the Tropics, by Major A. L. Otway.

TROPICAL DISEASES BULLETIN, February, 1926.—This number contains an especially valuable critical review on yaws and syphilis by H. S. Stannus. In his survey of the literature of the last six years he has included such little-understood conditions as goundou, juxta-articular nodules, and gangosa. The controversy on the exact relationship of yaws to syphilis, and vice versa, continues to excite attention and is, apparently, still far from solution.—C. M. Wenyon is responsible for résumés of work on kala-azar, relapsing fevers, and other spirochætoses. Rat-bite and yellow fevers are also dealt with by the same reviewer.—A section on malaria by Clayton Lane contains some 50 abstracts, the chief of which is a record of the proceedings of the International Malaria Congress held in Rome in October, 1925.

New Inventions.

SUCTION DILATOR.

THIS instrument is a modification of Kollmann's dilator to enable suction of the urethral surface to be carried out while the urethra is in a state of dilatation. The central rod of the dilator has 12 openings connecting with a hollow central tube and surrounding this tube are the dilator blades. The blades and central rod can be detached from the rest of the instrument by thumb-screw, thus enabling the instrument to be satisfactorily cleansed and sterilised. When the dilator blades and rod are attached to the whole instrument the central opening is continuous to the side taps A and B. Side tap A is the flushing tap to enable the dilated surface of the urethra to be washed with an antiseptic. The tap B can be utilised as the outflow for the antiseptic; it can, in addition, be used as a suction tap either prior to or subsequent to the washing of the urethral canal. To enable suction to be carried out on the dilated urethra, the dilator is inserted into the urethra with the usual precautions and gradually dilated up. A Bier's bulb, with a valve inserted in the bulb so that on compression of it no air is forced into the urethra, is attached to tap B. Alternate pressure on bulb and relaxation of this pressure exercises the necessary suction and creates a negative pressure on the urethral surface. Alternately, and to obtain greater negative pressure on the urethra, the suction syringe may be used, the valves of which are so arranged that, on pressing home the piston, no air is introduced into the urethra, while on relaxing the piston strong suction is exercised on the urethral surface. By means of a thumb-screw the handle can be detached from the instrument to enable it to be satisfactorily sterilised. Indications for the use of this instrument are subacute and chronic littritis and lacunitis and subacute and chronic infiltration of the submucous tissues. Considerable suction can be exercised on the mucous surface of the dilated urethra without damaging the epithelium. The venous congestion set up by the negative pressure inside the urethra tends to hasten absorption of submucous infiltrates.



Suction dilator.

Bier's bulb.

Suction syringe.

This instrument has been kindly made for me by Down Bros., Ltd., 21 and 23, St. Thomas's-street, London, S.E. 1, and is made of stainless steel.

DAVID LEES, M.B., F.R.C.S. Edin.

THE LANCET.

LONDON: SATURDAY, APRIL 3, 1926.

PRINCIPLES OF TREATMENT IN RELATION TO NERVOUS DISEASE.

THE Lettsomian lectures, delivered before the Medical Society of London by Dr. E. FARQUHAR BUZZARD and published in recent issues of THE LANCET, deal with an aspect of medical practice of much importance; indeed, his enumeration of therapeutic principles is applicable to quite other departments of medicine than that of neurology. Although not stated by the lecturer in so many words, perhaps, one of the most vital of these principles, as far as its possibilities for good or harm are concerned, may be expressed in the form of a question as follows: To what extent should the patient be informed of the position of professional knowledge in regard to the curability or otherwise of his disease? Dr. BUZZARD adopts the view, which some may think even in regard to nervous disease unduly pessimistic, not to say nihilistic, that physicians have no pretensions to curing disease and that they are in a position to act only as Nature's allies and agents. Assuming this attitude, he would thereupon take the patient into his confidence and in well-chosen words outline what is known of the action of various remedial drugs or other medicaments; he would sketch, possibly, the pathology of the particular affection, and would then say that while certain therapeutic procedures, often asked for by the patient himself, are, in fact, useless, some improvement might be possible by certain other methods, though the morbid process itself is still without any proved, specific, antidote. The Parkinsonian would be told to place little or no reliance on treatment; the neurosyphilitic would be informed that treatment is to go on for the rest of his life; the patient with progressive muscular atrophy or bulbar palsy would learn that the cause of his affection is unknown and that no trustworthy remedy exists.

These, it will be seen, are merely examples of how the general principle works in particular cases, and it is clear the adoption of such an attitude on the part of the physician requires a degree of moral courage as well as a due modicum of personal tact and sympathetic insight. We think the experience of all who are in a posifion to express an opinion that carries weight will be in favour of the plea that the patient should be taken into the physician's confidence, provided the former is of sufficient intelligence to appreciate the facts, and of sufficient level-headedness to discount beforehand any depression of spirits such information may entail. On the presence of these two features in the "make-up" of the individual concerned much obviously will depend. Over and over again in clinical medicine is the doctor called on to decide whether absolute honesty is the best policy, and whether, as Dr. BUZZARD says with truth, he will run the risk of losing some patients while he endeavours to save them the misery of those alternating hopes and disappointments which are the lot of the incurable seeking cures. The problem is age-old, and probably no hard-and-fast solution of universal applicability is practicable. Some patients do not want to know medical details about themselves, and do not wish for blunt acquaintance with prognostic and therapeutic facts; where ignorance is bliss, they may quote with approval, 'tis folly to be wise. Others, again, may be judged not to be composed of such stuff as will resist the blow which full revelation of the nature of their nervous malady will strike them. Still others will listen unmoved to sentence of ultimate death, as it may amount to, and yet not accept the decision as final. They will not entertain the idea of incurability, even though the physician qualify his pronouncement with some emendation such as "in the present state of our knowledge"; they will catch at any straw floating on the stream bearing them away, and who is to say human nature errs in this respect? What constitutes incurability? And how are we to know that this or that novelty in neurological therapeutics is valueless unless it is given a long and fair trial? Indeed, it is a sort of stock argument with those who resort to unqualified practitioners and for whom Dr. BUZZARD has a scathing comment that not a few of our recognised therapeutic methods owe their inception to the empirical discoveries of individuals outside the ranks of the orthodox profession. While we must be prepared to ignore the misapplication of this argument it is well, we think, not to be too dogmatic in respect of incurability, or too modest in regard to what we may be able to accomplish. After all, each case should be decided on its intrinsic merits; while we can legitimately inform the Parkinsonian that hitherto no specific treatment has been unearthed, or the bulbar paralytic that the specific remedy is the discovery of the *elixir vitæ*, we need not confess to entire therapeutic helplessness. With the right kind of patient, intelligent enough to realise his own and his physician's limitations, it is a pleasure often to coöperate in the endeavour to try out, it may be empirically, some remedial measure, some novel therapeutic technique, which at least furnishes him with the mental satisfaction that something is being done. Such efforts call to deep-seated instincts within the sufferer's breast and are not wisely relinquished. For not a few nervous affections our attempts at treatment would be more scientific were we not too often wedded to conceptions of them gleaned solely from consideration of their morphological pathology. Examination of the morbid material obtained from a case of anterior poliomyelitis or of disseminated sclerosis provides us with little information in regard to the processes at work, and still less in respect of the postulated virus. Not until experimental pathology took charge of research concerning the former of these was any real advance made in the direction of rational treatment; and the same lesson will have to be learned in connexion with the latter. Dr. BUZZARD extols, rightly, as most will agree, the usefulness of arsenic and arsenical compounds for cases of disseminated sclerosis; yet their employment is not based on a rational or scientific therapeusis, since the cause of the disease remains undiscovered, however near we may be to that desirable eventuality. Similarly, with the use of bromide in epilepsy—its clinical value is justly stressed by the lecturer, even if the intimate nature of the affection is as elusive as ever, and its origination as indefinite as in the days when epileptics were judged to be possessed. As far as these and other neurological ailments are concerned, incurability must be a relative and not an absolute term; at any moment the phase of uncertain knowledge may be succeeded by that of certain knowledge, and the disease emerge from pathogenic obscurity into the full light derived from ætiological solution.

It is interesting and noteworthy that Dr. BUZZARD should assign prominence to psychotherapy, declaring

it to be still the most valuable weapon we possess for every-day use in our array of remedial agents. He uses the term in its widest sense, and regards it as an essential factor in the treatment of all patients suffering from organic disease. Doubtless few will be found to quibble with this contention, since all clinicians who impress their personality on their patients, winning their confidence and trust, and paving the way for coöperation, are, as a fact, exercising psychotherapeutic principles whether they realise it or not. Generations of physicians have done the same before us. But the neurologist is more concerned with the technical usefulness and usableness of strict psychotherapeutic procedures in the handling of the classes of patient he meets in practice. According to Dr. BUZZARD the only psychotherapy permissible for the manic-depressive psychotic is "sympathetic encouragement and the daily audience of his woes"; the anxiety neurotic, on the other hand, requires mental probing and investigation, as does the psychasthenic, who suffers from phobias and compulsions. The hysterical patient, too, is a fit subject for the art, which is stated to include suggestion, education, and investigation methods. It would be informative to have in some critical shape the embodied experience of neurologists as regards the results obtained by recourse to these procedures; data bearing on recovery, relapses, and recurrences, on amenability to treatment of different clinical types, on the influence of the methods on constitutional as opposed to symptomatic phenomena, would prove of service. If psychotherapy is as indispensable as it is claimed to be, the clinician should not only familiarise himself with its technique, but should be instructed in the art of selecting methods for cases; psychotherapeutic knowledge should be much more systematised than it is at present, more standardised, more accessible. But our psychotherapists disagree among themselves; hypnotic measures are effectual in the hands of some and permanently tabooed by others; psycho-analysis is a therapeutic sanspareil according to one school, and distinctly over-rated according to another; Couéism, so to describe it, answers all the calls that are made on it, according to a third. The physician who would be true to himself and who fights shy of any treatment even remotely suggesting charlatanry or humbug is sometimes hard put to it to deal effectually with the minor psychoneurotic disorders that abound in these days; his position would be strengthened were he able to refer to a consensus of medical opinion as to the relative usefulness of different forms of treatment. The profession will not be lifted above rivalry with quacks, as Dr. BUZZARD urges, unless therapeutics are based on sound knowledge derived from anatomical, physiological, and psychological considerations; however arduous the road to follow, and it becomes more laborious with every increase in medical lore, we cannot imagine the profession as a whole even hesitating to face it.

THE INTOXICATED MOTOR DRIVER.

IN Monograph No. 1, issued by the True Temperance Scientific Committee, and entitled the Problem of the Intoxicated Motor Driver, there is much that is true, temperately stated, and scientifically interesting. The law is not perfect, though Section 40 of the Criminal Justice Act of 1925 (which comes into force next June) modernises it by definitely penalising "any person who is drunk while in charge on any highway or other public place of any mechanically propelled vehicle." It is not certain, however, that the Committee will cure the law's imperfection by its recommendation that the words "drunk" and "drunkenness" shall be expunged from the statute book, and that emphasis be laid rather "on the incapability, disorderliness, nuisance, or danger resulting from the alcoholic intoxication." To eliminate "drunkenness" and to let the word "intoxication" stand will leave the old problem unsolved. The Committee's argument is that the law objects not so much to drunkenness in itself as to drunkenness in relation to environment or occupation; the legal offence is not being drunk, but being drunk and disorderly, drunk and incapable, drunk in charge of a child, or in possession of fire-arms, and so on. But this is not the whole story. Simple drunkenness, unaccompanied by other conduct on the part of the drunken person, does exist upon the statute book; the offence may consist partly of conduct on the part of some other person who may be perfectly sober. There is the offence of permitting drunkenness on licensed premises, procuring a drunk man a drink, selling him fire-arms, or taking a pawnbroker's pledge from him. The law, of course, is more concerned with what a man does than with what he is (the Post Office Act even uses the words "guilty of an act of drunkenness"); it is easier to prove what he does than what he is. But in the end we come back to the necessity for some simple word like "drunk" which all can understand. "His gait was unsteady," says the police witness, "his breath smelt of alcohol, his face was flushed, his pupils were dilated——" "Yes, yes," interrupts the magistrate, who is willing to leave these symptoms to cross-examination, "what we want to know is, was he drunk?"

The Committee goes on to recommend that, until the law gets rid of the word "drunk," magistrates should be allowed to interpret "drunkenness" in different degrees according to the circumstances. "Thus," says the monograph, "a motorist would be defined as drunk at a considerably lower degree of intoxication than would be required for a pedestrian and at a slightly lower degree than for the driver of a horse-drawn vehicle." Degrees of drunkenness and of danger are already taken into account at present in assessing penalties; if the Committee means that a magistrate is to convict as "drunk" a motorist who is not quite drunk, fresh legislation will be required. Finally, the Committee refers hopefully to the urine test for alcoholic concentration. Dr. GODFREY CARTER'S paper on this subject, read to the Medico-Legal Society last January, was reported and discussed in THE LANCET[1] at the time. Dr. H. W. SOUTHGATE, who (as our report showed) then explained the tests on alcohol concentration in blood and urine which he had been conducting for four years, is one of the True Temperance Scientific Committee whose names appear on the monograph under the presidency of Sir JAMES CRICHTON-BROWNE. The Committee observes: "The urine test for alcoholic concentration, if clearly proved to be reliable, should be adopted as a routine test, a portion of the urine being always reserved for the examination if desired by the individual's private doctor and by some responsible analyst as well." This is an admirable proposal, subject to obvious qualifications. In the first place, persons who have just been taken into custody will not necessarily submit to tests which are voluntarily undergone in the course of medical examination on other occasions, nor are the courts likely to accept refusal as indication of guilt. A more important reservation is already indicated by the Committee's words "if clearly proved to be reliable." Proof will be clear only when it is no longer possible for a defendant to produce

[1] THE LANCET, Jan. 23rd, 1926, pp. 188, 207–09.

medical evidence that the urine test for alcoholic concentration is unreliable. This is by no means yet the case, but the investigation is at any rate promising, and the Committee does well to draw attention to it. There is plenty of room for philosophic and scientific inquiry into the questions "What is drunkenness?" and "What is true temperance?" and there is certainly no occasion when the diagnosis of drunkenness requires more anxious consideration than where the action of a motor driver is concerned.

INTERNATIONAL HEALTH ORGANISATION.

INFORMATION as to public health progress each year in various countries has not hitherto been available in a form convenient for comparison. Handbooks setting out the conditions under which the national health is officially and unofficially promoted in certain countries were published in 1924 and 1925 under the auspices of the League of Nations,[1] but though a detailed questionnaire had been circularised there was little uniformity in the sequence or even the substance of the data supplied. Moreover, the development of public health activity is rapid, especially in those countries whose method of government has been reconstructed since the war. Recognising that changes in legislation and procedure are constantly taking place, the Health Section of the League of Nations have arranged to supplement the information offered in the handbooks, each of which was prepared by a member of the health administration concerned, by the issue of an annual progress report, in which the more important developments of the preceding 12 months in each country are reviewed. In the first of these reports, which bears the title International Health Year Book, 1924, it may be said that the current activities of 22 countries are described, for legislation passed or statistics recorded any time up to the first part of 1925 are included. In these summaries, which vary in length from the brief eight pages emanating from Canada to the 42 pages supplied by Spain, an effort has obviously been made to collect information as far as possible under corresponding headings for each country. Not all the authors have fallen in with the scheme, but most of the reports are divided into four or five sections. In the first of these, area, population, birth- and death-rates, infantile mortality, and budgets are set out. The second describes recent reforms in health administration and legislation. The third is devoted to preventive medicine and hygiene, under the subheadings tuberculosis, cancer, venereal diseases, malaria, trachoma, alcoholism, maternity and child welfare, and mental hygiene. The fourth section, entitled curative medicine, discusses hospitals, sickness insurance, numbers of doctors, students, and midwives, and medical education. A fifth more general section is mostly devoted to the control of foodstuffs, drugs, and biological products, while notes on housing and methods of health propaganda also find a place. Even where this orderly arrangement has not been followed, an admirably compiled index enables students of a particular subject to pick out the relevant section in each of the 22 articles without effort. Those who wish to compare each nation's methods of combating tuberculosis, venereal diseases, or diphtheria will see at a glance where to find them without having to read about drainage systems, hospitals, or budgets. Incidentally, the figures given under the last-named heading are the least profitable, since without a table of the relative values of the national currencies and an estimate of the cost of living no useful comparisons can be made. Those countries which do make a statement on the cost of living—Bulgaria and Latvia—have to record a continuous rise. In Bulgaria the index, calculated as 100 for the years 1901 to 1910, had risen to 2492 in 1920, since then increasing every year to 3763 in 1924. The State has since attempted, by offering the communes credit for food-supplies, by an alteration in its export policy, and by the establishment of cheap railway tariffs, to check any further advance.

The relapse into less civilised conditions which has been the fate of many of the belligerent European countries is manifest, but their painful struggles to recover from the degradation caused by severe economic distress are no less evident. In Bulgaria an epidemic of typhoid fever in 1924 (7127 cases against 2799 in 1923) is attributed to lack of drainage, of sanitary conveniences in houses, and of a supply of pure drinking water. The prevalence of trachoma in Slovakia is said to assume the character of a social scourge affecting 50,000 out of the 3 million inhabitants. Energetic measures to combat the disease, including free dispensaries under expert medical and nursing supervision, were initiated in 1924; in that year 113 communes with 60,000 inhabitants were examined and some 5000 trachoma patients discovered and treated. An unusually comprehensive system of sickness insurance has been instituted in Esthonia. This includes treatment in hospital when required, with full maintenance and assistance in confinements. From Germany comes the welcome news that the mortality from tuberculosis was considerably lowered in 1924, but the incidence of the disease has apparently increased. In the section on medical education the numbers of medical students at German Universities is given for the years 1921 to 1924. The men students decreased in number steadily from 13,933 to 7728 during this period; the women also decreased, but only from 1937 to 1328. Greece reports a satisfactory situation with respect to epidemics. During the last 12 years of all the Balkan countries Greece has had the fewest victims from cholera, small-pox, and typhus. Moreover, in 1924 those diseases which were epidemic in 1923 have been checked—for example, encephalitis lethargica claimed only 13 victims, with 3 deaths, against 694 with 84 deaths. In Latvia, as a legacy of the old Russian administration, there remain some 160 registered "assistant doctors" who are allowed to practise within certain limits; it is stated that this profession will cease to exist in 10–20 years. The campaign against venereal disease in Austria is complicated by the increase in unregistered prostitutes, but is being actively pursued. In this country a law passed in 1924 defines the regulations for the practice of midwifery and provides for compulsory revision courses for midwives.

In contrast to the struggle of the war-spent countries to reorganise their health services is the steady progress made by some of the neutral countries and by the United States of America in their efforts to consolidate, improve, and extend systems which have had no rude set-backs. Administrative changes adopted during the period under review in these countries are concerned mainly with the further development of a public health organisation of proved value, or with State control of activities started by voluntary enterprise. In 1924 official recognition by the Spanish Department of Public Health was given to the anti-malarial organisation set up during the previous four years. An extensive campaign has now been undertaken under the direction of a central committee. A six months' course has been organised for ten doctors chosen from among the applicants; three months are spent in laboratory work followed by three months' training under supervision in a malarial district. This course was started in April, 1925. In the United States many important health matters are not under the jurisdiction of the Federal Government, but are controlled by the several States. The section on recent developments in health administration and legislation records for the most part laws which have only local significance. For example, in six of the States but not in the rest, a man must produce a certificate of freedom from venereal disease before receiving a marriage licence. Other even more curious anomalies are manifest if this section is carefully studied. It may be that the method of trial on a small scale is

[1] See THE LANCET, 1925, ii., 652, 719, 771, and 885.

likely to lead to good results, especially if legislative assemblies profit from the experience of neighbouring States. Similarly a study of the International Health Year Book, supplemented by the exchange of visits between European public health officials organised from time to time by the League of Nations, should enable the older countries to learn from each other and to discover the most effective ways of coping with existing causes of ill-health and preventing the introduction of fresh ones.

Annotations.

"Ne quid nimis."

THE NEW OPIUM POLICY OF THE INDIAN GOVERNMENT.

IN opening the Council of State last February the Viceroy of India announced a new policy of the Indian Government in the matter of the opium trade which is as welcome as it is revolutionary. This policy the Viceroy declared to be "in accordance with the trend of modern opinion in a number of other countries and also with views which have been freely expressed in some quarters on different occasions in India." Only four years ago the India Office, in an official statement entitled "The Truth about Indian Opium," maintained that the Government of India stood unhesitatingly on the findings of the Royal Commission of 1893–95. That report justified the Government opium monopoly, the Indo-Chinese trade, the export of Indian opium to the Far East, and demurred to the loss of revenue which the surrender of such trade would involve. It is true that Lord Morley, when Secretary of State for India, admitted that the report of that Commission had failed to carry conviction, yet even at the Geneva conferences in 1924–25 the British delegates expressed themselves as quite satisfied with the present system of production and distribution of opium by the Indian Government and maintained, "Everything is controlled by the Government, and effectively controlled." The Indian Government's representative at Geneva described his Government's policy as that "of deriving the maximum of revenue from the minimum of consumption." There has undoubtedly arisen a strong movement in India itself against the Government policy both in the matter of purveying opium for eating to the natives and of exporting large quantities of the drug well knowing it is to be used for smoking purposes. A booklet recently published by the Student Christian movement from the pen of Mr. C. F. Andrews, entitled "The Opium Evil in India," has drawn attention to the evils arising from addiction to the drug especially in the cities, while the report of the "Assam Congress Opium Enquiry" gives evidence of the prevalence of abuse of the drug in that province both by eating and smoking and of the need to limit its production to what is necessary to meet legitimate medical requirements.

The new policy, now announced, while throwing over the official apologists for past action, is intended "to reduce progressively the export of opium to all destinations so as to extinguish the trade altogether within a definite period except for strictly medical purposes." It is recognised that "this policy will involve a corresponding reduction in the amount of opium produced": if it is also held to involve the reduction of the supply of Government opium for internal consumption to that required "for strictly medical purposes," it will have achieved the objects at which the International Opium Convention of 1912 was presumed to have aimed.

THE BIRMINGHAM MEDICAL INSTITUTE.

THE *Birmingham Medical Review* first appeared in 1872 as a quarterly journal. After a while it became a monthly, and it only ceased publication with its 479th number owing to the difficulties of the war. Now it is making a welcome return in a new series, of which the first copy[1] appeared in January, incorporating the *Midland Medical Journal* as well. It is the official journal of the Birmingham Medical Institute, which entered its new premises in Great Charles-street in 1924, and, under the presidency of Colonel Frank Marsh, has become more and more firmly established as the centre of medical life in the city. The Institute has a valuable library of 16,000 books to which additions are continually being made; there is a comfortable reading-room with a large number of current periodicals, and light refreshments can be obtained in a tea-room. It is used for the meetings of the local branch of the British Medical Association, the Midland Medical Society, the Midland Obstetrical and Gynæcological Society, and the Birmingham and District Medical Women's Association. The Panel Committee is also housed there. The Midland Medical Society is now a section of the Institute, and it is to be hoped that much good will come of these coördinated arrangements. The *Review* itself is an excellent production. It is edited by Dr. K. D. Wilkinson, who has the assistance of a representative editorial committee, with Prof. W. H. Wynn as chairman, and it deserves a large circulation. The first number contains the first Ingleby Lecture for 1925, delivered at the University of Birmingham by Dr. J. G. Emanuel on Auricular Fibrillation, and an entertaining address by Dr. A. V. Bernays mainly on the text "Knowledge comes, but wisdom lingers." There is also an article on the Treatment of Acute Perforative Peritonitis by Mr. G. P. Mills, and a memoir of Dr. William Withering by Prof. Wynn. The journal should do much to encourage medical men to join the Institute, the membership of which at present stands at only 262. It is hoped to arrange for a composite subscription to include use of the buildings, membership of the Midland Medical Society, and the receipt of the *Review*.

MECHANICALLY-COOLED REFRIGERATORS.

ONE of the most interesting features of the *Daily Mail* Ideal Home Exhibition at Olympia was the display of electric refrigerators. Several firms showed a considerable range of these appliances, all designed for running from ordinary house lighting circuits. The principle of most of the refrigerators is the same and depends on the rapid absorption of heat from the surrounding medium occasioned by the boiling of sulphur dioxide under reduced pressure. The gas system is a closed circuit of metal tubing connected with a cylinder of liquefied sulphur dioxide. This part of the apparatus is charged before the refrigerator is installed and needs no attention, as the gas is re-condensed automatically and used over and over again. The reduction of pressure and circulation of the gas is maintained by a small suction cylinder operated by an electric motor, the whole apparatus being neatly arranged in the base of the refrigerating cabinet. Both British and American models are to be had, the former being run by a quarter horse-power water-cooled engine, the latter by a half horse-power air-cooled type. The cold water system of the British model, shown at the "Freezone" stand, is claimed to reduce the cost of running, and enable the machine to work at very low pressures. The air-cooled models are slightly less trouble to fit up as it is only necessary to have a wall-plug and switch to complete the connexion. The "Electrolux" unit differs from the "Frigidaire" and from most of the others in that its efficiency depends not on sulphur dioxide but on the evaporation of ammonia inside a hermetically sealed apparatus. No compressor with valve and therefore no motor is required, but only a small quantity of heat—which may be supplied by electricity, gas, or oil—to start the evaporation and control the circulation of the refrigerant. Various sizes and shapes of cabinet are obtainable ranging from small household models to large cold-storage cabinets capable of holding carcasses of meat.

[1] Birmingham Medical Review. Birmingham: Cornish Bros., Ltd. 1s. 6d.

All the outfits appear to be provided with some form of thermostatic cut-out, thus obviating loss of power and maintaining any required temperature from five degrees below zero upwards to room temperature. Fluctuations of temperature are guarded against by the presence, usually about the centre of the cabinet, of a large cold coil surrounding an ice-making contrivance. The ice is made by filling the special containers with tap-water, replacing them in the cabinet, and turning on the switch. The time required to produce ice depends on the setting of the thermostat and can be varied from two to six hours at pleasure. The cabinets are for the most part lined with white porcelain, all the angles being rounded to facilitate cleaning. The "Barnet" refrigerator, a Canadian production, is not mechanically cooled but is essentially an ice chest de luxe. It is very well insulated and has a ventilating system which prevents the possibility of stagnation of the air in the refrigerator when the doors are closed. In this cabinet, such varied articles as kippers, Gorgonzola cheese, onions, coffee, and tobacco can be stored side by side for 72 hours without contaminating each other with their respective flavours. Under ordinary running conditions the inside temperature is maintained slightly below zero, so that the inside of the cabinet remains quite dry, an advantage over the usual form of ice-box.

Though appliances of this kind are widely used in American hospitals, in this country it is the commercial world rather than the scientific which has been the first to take up electric refrigeration—a fact which may be accounted for by the high price of the outfit. Compared with the initial outlay the running cost appears to be low, most refrigerators consuming from two to six electrical units in 24 hours. Once installed, the apparatus needs hardly any attention beyond an occasional drop of oil for the motor bearings, and the running is practically silent. The possibilities of electric refrigeration in hospitals and laboratories seem to have been somewhat overlooked up to the present, yet the possession of a low temperature thermostat working from the ordinary lighting circuit would be a great boon to many departments. Whether they are yet likely to replace ice-boxes for domestic use depends on the extent to which the initial cost can be reduced. A plea for the more extensive use in households of cold as a preservative of food is the substance of an interesting little volume just published entitled "Food Wisdom."[1] It contains illustrations and descriptions of various forms of ice-boxes and mechanically-cooled refrigerators. A paragraph purporting to estimate the comparative initial and the running cost of the different types of refrigerators in the home, begs the question since the price of the units is not mentioned. It is stated that the running cost of a good mechanically-cooled model should not exceed 2*d.* or 3*d.* a day, whereas the cost of replenishing an ice model is likely to be 5*d.* or 6*d.* daily, reckoning the cost of ice at ½*d.* per pound. These estimates admittedly depend on at least two variables, the retail price of ice in small quantities and the rate charged for electric current; and to deduce from them that for middle-class households the heavier initial cost of the mechanically-cooled apparatus will "soon be more than made up and there will be an actual saving" appears to us unjustifiable at present, though the statement may have prophetic significance. The present retail prices of the smallest model on the market of the mechanically-cooled refrigerator named above are "Frigidaire," £64; "Electrolux," £39 10*s.*; and "Freezone." The middle-class housewife in this temperate climate will hardly be tempted even by low-running costs to embark on such a purchase, for the days on which ice is anything but a luxury are few. However, the arguments set out by Mrs. Cottington Taylor in favour of using cold as a food preservative are unanswerable, and we trust that manufacturers will soon be able to give middle-class housewives an opportunity of profiting fully from her advice.

[1] By D. D. Cottington Taylor, A.R.S.I. Assisted by P. L. Garbutt, A.I.C. London: Sir Isaac Pitman. 1926. Pp. 136. 2*s.* 6*d.*

DEEP DIVING.

THE *Laurentic* was a 15,000 ton Atlantic liner which was taken over by the Admiralty during the war and converted into an armed cruiser. Early in 1917 she sailed from Liverpool with five million pounds worth of gold bars for Halifax, and was sunk by mines off the Donegal coast in 120 feet of water. Diving operations were soon begun, the strong room reached, and a little of the gold brought up. A violent gale then interrupted operations, and when the divers were able to get down again they found that the ship had broken up and collapsed, and that the gold was buried at the bottom of the ruins. So they set to work to break and blast their way through the remains, and when operations finally ceased in 1924 more than 98 per cent. of the bullion had been retrieved, and that without loss of life or any serious injury. The bracing narrative of this triumph of applied physiology is told in the *Journal of Hygiene* (1926, xxv., 26) in a most interesting way by Captain G. C. C. Damant, R.N. (retd.), who was throughout in charge of the operations and who will be remembered as having collaborated with Prof. J. S. Haldane in working out experimentally the theory of compressed-air illness which found expression in the Admiralty rules for diving of 1907. These rules, based on the rates at which the body becomes saturated with nitrogen in compressed air, and at which it gets rid of the excess on returning to atmospheric pressure, were used in diving at the *Laurentic*, and, with one exception, proved very satisfactory; if anything, indeed, they erred on the side of safety. Experience showed, however, that a longer time ought to be allowed between two dives than the regulations suggest; getting rid of the last of the excess nitrogen absorbed under pressure takes longer than had been supposed, and Captain Damant found that lengthening the interval from one and a half to four hours was not really enough to make the second dive as safe as the first. In all, out of about 5000 dives at a pressure of about 55 lb. per square inch, there were 31 cases of illness. One was blind, one paraplegic, and two or three others had nervous symptoms; the pains in and about the joints, known as "bends," were the most frequent trouble. An adequate recompression chamber was provided on board the diving ship from the beginning. This, as Captain Damant points out, gave everyone confidence and proved quite efficient in curing the cases of illness. Violent muscular work during the ascent from the bottom seemed to help to prevent symptoms, and breathing oxygen after reaching the surface also appeared to be of value. Everyone will congratulate Captain Damant on a happy issue to a difficult and dangerous piece of applied physiology.

AFTER-EFFECTS OF ENCEPHALITIS LETHARGICA.

SCHOOL medical officers have special opportunities of studying the results of encephalitis lethargica. Long after the acute stage is over serious alterations in the nervous system may appear and persist, increase, or slowly diminish through a period of several years. Information is needed as to the course and prognosis in these cases and the best way of dealing with them. Many parents will not keep these children under prolonged treatment and observation, so that practitioners and hospital staffs lack the opportunity to follow them up. But in the schools these after-effects and the conditions influencing them may be observed over long periods and in comparatively large numbers. In large towns, such as London, Liverpool, Manchester, and Bristol, data have been collected in the school reports, and in Sheffield the local medical research committee is studying the disease with the coöperation of the school medical officer. The main after-effects fall into four groups: (1) Parkinsonian syndrome; (2) other disturbances of motor nervous

system, such as ocular paralysis and spasmodic movements; (3) mental impairment affecting mainly intellect; and (4) mental changes affecting emotion and volition. Some of the facts which school experience has elicited about these after-effects may be set out categorically thus:—

(*a*) After-effects tend, on the whole, to be more severe and permanent when the illness has occurred in early life. (*b*) Various classes of sequelæ may occur almost independently or are at least not positively correlated—e.g., the cases showing the severest paralysis are often not those with the most mental changes. (*c*) Cases showing the most temperamental instability are sometimes the children of neurotic parents, and inquiry frequently reveals that the child showed definite signs of an unstable nervous system long before the illness. (*d*) Symptoms such as disturbance of sleep rhythm and ocular signs are found early and often diminish later, while changes in the nervous system and mentality manifest themselves much later. (*e*) Intellectual impairment, when it occurs, is not commonly severe enough to render a child suitable for education in a special school for mental defectives. (*f*) Prognosis is still uncertain, a fair proportion making more or less complete recovery, but those with definite signs of paralysis usually do badly. (*g*) Exclusion from school, especially in cases without paralysis, with consequent running the streets, usually is apt to make matters worse. (*h*) Many cases may profitably return to school after a few months' convalescence, the occupation and discipline being beneficial. (*i*) Many others can benefit from education and training, but need conditions somewhat different from those at an ordinary elementary school. (*j*) In a few cases where delinquency has brought them within the law, the firm discipline and care of an industrial school has had a good influence on the character, though there are others who have entirely failed to respond. (*k*) There are a few cases with marked intellectual failure which must be treated as mentally defectives, but the great majority are not suited for such treatment.

The consensus of opinion is at present in favour of dealing with these children as a separate group, certifying them, if necessary, as physically defective, and sending them to special classes attached to a school for the physically defective or to an institution such as that recently opened by the Metropolitan Asylums Board at Winchmore Hill. Either method should afford valuable experience for future guidance.

ACCIDENT PREVENTION AND SCHOOL-CHILDREN.

THE Third International Congress for Life-saving and First-aid to the Injured is to be held at Amsterdam next September, and we reported last week (p. 683) the meeting of the British Council which is helping forward the arrangements. The whole subject is now being studied from a wider standpoint. The statistician has been shepherding into the epidemiological fold occurrences usually designated "accidents"; at the same time modern views on their occurrence and their prevention have been undergoing great modification. The personal factor, entitled "carelessness," is now recognised to be far more responsible than obvious risk, such as unguarded machinery. This factor is being found to depend partially upon ignorance of risk and partially upon a definite predisposition to sustain accidents which are associated with ill-being or a predisposition to sickness. These views are only slowly being adopted in this country, but in America [1] they are being widely accepted, and are receiving practical application in many directions. Perhaps no extension is more interesting than a widespread scheme of safety education in the schools as an introduction to the prevention of accidents in industry and in later life generally; it is accepted by employers as a logical method of preparing for safety work in the factory and the mine. Accidents are divided into groups—e.g., street accidents, fire, falls, and so forth—one for each month of the school year. Safety committees are formed among children; scouts are set to guard street crossings coming to and leaving school; newspaper reports of accidents are discussed and essays are written. The spirit is introduced in class work; thus arithmetic is done on accidents figures, which are also used for making graphs, while for drawing safety-first posters may be used. Outside school hours fire-drill and games give other opportunities. The scheme does not discourage facing the element of danger, but teaches the right and most efficient way; it does not encourage cowardice, but instructs the brave. Just, however, as health is necessary to receptivity in all education, so here "an awkward, cautious child is more apt to get hurt than the child who apparently takes chances, but whose senses are keen and body responsive and under perfect control." Already 276 towns are reported to have introduced some form of safety teaching in the schools and results are becoming apparent. Motor-car accidents increased steadily at all ages from 1911 to 1919, but the next two years showed a decrease, mainly concentrated in the ages 5 to 15; in Portland, Oregon, accidents to school-children fell from 160 in 1920–21 to 60 in 1921–22; in Detroit the number of children killed fell from 96 to 30 in the year following the introduction of safety work. Will school medical officers please copy.

[1] The Safety Education of Children as a Factor in the Prevention of Industrial Accidents, Industrial Safety Survey, November–December, 1925, vol. i., No 5, pp. 125–134.

RICKETY DEFORMITIES.

RECENT discussions in Paris have revealed so much difference of opinion on the treatment of rickety deformities that the *Vie Médicale* (Feb. 26th) has held a kind of symposium on the subject. The impression gained from a study of all the contributions in it is that in France, and also perhaps in Switzerland and Italy, expectation of the spontaneous correction of these deformities is much stronger than in this country. Prof. Camera goes so far as to say that during the three years that he has been at the head of the children's surgical department at Turin he has not seen one case needing surgical intervention. Patients are nowadays brought for treatment at a very early stage, and it is gratifying to compare the present state of affairs with that of 20 or 30 years ago. In the 11 years 1895–1905 719 cases in Turin required surgical intervention. Among the French thalassotherapeutists—under which name are grouped those who believe in the specific virtues of sea air—some stoutly maintain that all, or nearly all, rickety curvatures disappear spontaneously at the seaside, while others admit that only in slight deformities can spontaneous cure be expected. The surgeons hold similar views, but less emphatically. They ask whether it is reasonable to leave the deformity alone for from two to five years at the expense of loss of stature and of probable static troubles. In this country it is a surgical commonplace that marked rickety curvatures are very seldom seen in the adult. What has become of the badly deformed rickety children of the end of the last century who were not operated on? There is no ground for assuming an excessive mortality among them, and it is necessary therefore to accept the hypothesis of spontaneous correction, despite the probable presence at one stage of extreme eburnation. Probably most British surgeons, in the national spirit of compromise, would decline to accept hard-and-fast rules. They would consider it bad treatment to keep a child off its feet for years, under all the developmental drawbacks thereby entailed, when in slight cases by the use of splints and in severe ones by osteoclasis or osteotomy the period of recumbency can be either avoided or enormously shortened—to the great gain of the child's physical and mental development.

THE HEALING OF GASTRIC ULCERS.

THE most striking difference between gastric ulcers produced experimentally and those encountered in human subjects is, perhaps, that the former are a type of ulcer in which it is extremely difficult to prevent healing from occurring, whilst in the latter chronicity is a prominent feature. So much is this the case that it has occasionally been alleged by

responsible surgeons that chronic gastric ulcers in human subjects never heal, and that therefore gastrectomy is the sole logical treatment to be advised. Such extreme views can scarcely be supported, but it is certainly true that conclusive evidence of the healing of gastric ulcers in human subjects is difficult to produce. The observations of Nielsen [1] point to definite healing in a considerable number of cases traced during 22 years, though the proportion of permanent cures was low in the more chronic group of ulcers. Recently, X ray observation of cases during and subsequent to medical treatment has tended to show the disappearance of ulcer craters, but such evidence requires much repetition and skilful application in order to be convincing. Peculiar interest, therefore, attaches to a recent paper [2] by Crohn, Weiskopf, and Aschner of the Mount Sinai Hospital, New York. In a number of cases of peptic ulcer these observers have been able to demonstrate the disappearance after treatment of the ulcer niche seen with X rays. But in addition to this they produce final evidence not only from subsequent laparotomies, where the healed ulcer has been visible and palpable to the surgeon, but also in several cases where partial gastrectomy has allowed microscopic examination to be carried out of sections through the scars of the healed ulcers. A very long history or a previous dangerous hæmatemesis had justified operative treatment in these cases, and the histological sections showed the process of healing to have consisted of obliteration of the crater by the growth of firm granulation tissue from the sides and base of the ulcer, the lateral surfaces becoming approximated and healing finally accomplished by the ingrowth of epithelial tissue from the sides of the wound. Whether such healing is permanent is, of course, not certain, being decided probably by circumstances which vary in different cases. It is of interest to note that in this series of observations the writers have come across several examples of the so-called "hæmatemesis without lesion," in which no evidence of ulcer was obtainable, but in which a chronic ulcer became demonstrable in later years.

THE HISTORY OF COLLOIDAL CHEMISTRY.

THE summary of the historical aspect of colloidal chemistry, to be found in nearly all of the many books recently published on this subject, tend usually to follow the same pattern. There is a fleeting reference to Faraday, and a detailed account of the researches of Thomas Graham, universally hailed as the father of colloids. Next we are led to consider Brown's observations on the phenomenon first described by him, and later we advance to the present-day views via Zigmondy and his co-workers. Practically every book in every language commences thus. Those prepared for a familiar repetition in the French language of this well-known story will be gratified on opening a book by Prof. W. Kopaczewski[3] to find facing the title page the photograph of one Francesco Selmi, whose name is probably unknown to them. They will be still more interested to find from the first chapter that the history of colloids dates from the writings of Bernard de Palissy in 1564. According to Prof. Kopaczewski colloidal sols of gold were prepared by the alchemists in the Middle Ages for drinking purposes. He describes research by quite a number of alchemists and chemists in 1674, 1794, 1797, and 1804. He then introduces us to the researches of Francesco Selmi, who in 1830 to 1854 distinguished between colloidal and true solutions. Graham came on many years later, and, according to the author, merely added the name "colloids," and applied the methods of diffusion. Prof. Kopaczewski sums up his view by stating, "Selmi est incontestablement le créateur de la science des colloïdes." This does not end the shocks to our classical views as to the history of colloids. Brownian movement was not apparently first seen by Robert Brown in 1827, but had been observed by Buffon and by Spallanzani years before. The historical summary lays great stress on the work of Marian Smoluchowski upon the mathematical side of the question. The fact that the rest of the book proceeds upon orthodox lines, and is a complete, up-to-date summary of modern views upon colloids, suggests that the author's historical researches have been conducted with the same critical judgment, and it seems likely that our conviction that British observers were the first to call attention to colloidal properties is mistaken, though it is probable that Graham worked at the subject independently and without knowledge of Selmi's researches.

[1] Acta Med. Scandinav., 1923, lviii., 286.
[2] Arch. Int. Med., 1926, xxxvii., 217.
[3] Introduction à l'Étude des Colloïdes. By W. Kopaczewski, Docteur en Médecine ès Sciences, Professeur à l'Institut des Hautes Études de Belgique. Paris: Gauthier-Villars et Cie. 1926. Pp. 226. Fr.15.

BRITISH ASSOCIATION MEETING.

THE British Association for the Advancement of Science will meet this year at Oxford from Wednesday, August 4th, to Wednesday, August 11th, under the presidency of H.R.H. the Prince of Wales, who succeeds Prof. Horace Lamb in the chair. His address, delivered on the first evening in the Sheldonian Theatre, will be relayed to the town hall, and, if necessary, also to the hall of the Oxford Union Society. Sectional addresses will be given by Prof. J. Graham Kerr (Zoology) on Biology and the Training of the Citizen; Dr. J. Drever (Psychology) on Psychological Aspects of Social Punishments; Prof. H. J. Fleure (Anthropology) on the Evolution of Human Races; and Prof. J. B. Leathes (Physiology) on Function and Design. During the meeting papers will be read on the Value of Tissue Culture in Biology, on the Training of the Zoologist, and on Inheritance of Physical and Mental Characters in Man. A discussion on Secondary Sexual Characters will centre around the respective parts played by inherent cell-organisation and by hormones in the development of the manifestations of sex. Prof. J. S. Haldane will lecture on Acclimatisation to High Altitudes. The sections will meet in the University Museum, the Clarendon Library, and various colleges and schools. Receptions will be held on the evening of August 5th by the Vice-Chancellor of the University and by the Mayor of Oxford, and public lectures have been arranged for every week-day evening during the meeting. Applications for seat tickets should be addressed to the Secretary of the British Association, Burlington House, London, W. 1.

COLONEL ALCOCK'S RETIREMENT.

Lieut.-Colonel A. Alcock, F.R.S., who in 1907 was appointed director of entomology in the London School of Tropical Medicine, and having reached the age-limit in July, 1924, was invited to continue in his post, when the London School of Hygiene and Tropical Medicine was founded, has now retired. His work has meant so much to the School that it was natural for his friends and colleagues to make some occasion for giving expression to the high esteem in which he was held by those associated with him, and a presentation of a suitably-inscribed loving-cup to him and Mrs. Alcock was made by the School on March 23rd, when Dr. Andrew Balfour wished them many years of continued happiness and assured Colonel Alcock that the School would not forget him. Colonel Alcock had reached the assistant chair of zoology in the University of Aberdeen before joining the Indian Medical Service in 1885, and it was not long before he found proper outlet for his bent in becoming surgeon-naturalist to the Marine Survey of India. After this he was for 14 years superintendent of the Indian Museum and professor of zoology in the Medical College of Bengal. His book on entomology for medical officers, which has passed through more than one edition, was no formal text-book, but was written with the definite aim of clarifying the entomological borderland so as to enable medical men to

recognise and follow up the insects and kindred creatures that invade the medical domain. Few books have served their purpose better than this book, whose scholarly writing makes it a pleasure to read and study. The dedication to Sir Patrick Manson, whom Colonel Alcock greatly revered, is in words which are now as applicable to the author himself:—

"First he wroghte, and afterward he taughte;
But in his teaching discreet and benigne."

Colonel Alcock has been succeeded as director of entomology by Dr. P. A. Buxton, but we may express the hope that he will long continue to illumine the subject of tropical medicine by his teaching in public and private.

THE VIRTUES OF THE ULTRA-VIOLET RAY.

FOR a generation most of us have recognised in a general way the value of the hygienic-dietetic régime in tuberculosis without inquiring very closely into the precise credit to be given to its various factors. Only recently has ultra-violet radiation come to claim a large share in the physiological uplift. At the Cambridge Conference, reported on another page, Dr. James Crocket expressed his opinion that even in pulmonary tuberculosis ultra-violet radiation may prove useful, although he gave a timely warning against regarding it as a substitute for other recognised treatment. In local tuberculosis, where phototherapy has come into wide use, its application is still empirical. At the Harveian Society on March 18th an interesting discussion took place on Treatment by Ultra-violet Rays, which Dr. Halls Dally summed up well by the remark that it was extraordinary how opinions could differ, and that at present our knowledge was very scanty. The well-known views of Dr. Leonard Hill, who opened the discussion, were challenged by Dr. Gordon Pugh, an abstract of whose address appears on page 741. He does not see reason to accept the prevalent idea that light imparts some special bactericidal power to the circulating blood. In his experience the undoubted beneficial effects of the open air are rather due to increased metabolism—from exposure of skin and the breathing of cool air—than to any special virtue in the rays of the sun. Has any new therapeutic principle really been introduced? he asks, or is it that fresh air and surface hyperæmia—those well-established healing agents—are only appearing again in another form? Dr. Pugh's own experiments have not led him to agree with Dr. Rollier's opinion, now so generally accepted, that the more a patient's skin becomes pigmented the better will be the protection against tuberculosis. A close parallelism between pigmentation and favourable prognosis would, of course, indicate that sunlight was the potent agent; but in Dr. Pugh's cases there has been no such parallelism. His opinions may nowadays be thought heretical, but Dr. Hill was right in pleading that they should not be forgotten in the report of the Biological Light Committee of the Medical Research Council. Dr. Hill was far from accepting them himself. Like Dr. Pugh, he said, he had begun by attributing the virtue of the open air to metabolic changes, but investigation of the claims of Bernhard and Rollier had made him modify his views very much, and now he was fully persuaded that light had a very powerful action. It was not unlikely, he thought, that some of Dr. Pugh's successful cases, in which there had been no sunlight treatment at first, had received great benefit from skyshine, which was very rich in ultra-violet rays.

ON March 29th Sir John Rose Bradford was elected President of the Royal College of Physicians of London in succession to Sir Humphry Rolleston, who retires after four years of office. Dr. R. O. Moon was elected assistant registrar.

CHESTERFIELD ROYAL HOSPITAL.—Although an additional ward was opened a year ago there is a waiting-list of nearly 400, and it is estimated that an expenditure of between £50,000 and £100,000 will be necessary to meet the growing demands upon the institution.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CLXVII.—THE TREATMENT OF TETANUS.

Prophylaxis.

THAT prevention is the best form of treatment in tetanus was proved during the war. Even if the disease develop after prophylactic serum, the incubation period is much prolonged, the symptoms are usually mild, often remain localised, and the condition is considerably more amenable to treatment. Consequently, in all wounds likely to have been contaminated with soil or external clothing, especially punctured or lacerated wounds, it is wise to give a prophylactic dose of antitetanic serum. This can be administered either subcutaneously in the abdomen or flank, or preferably intramuscularly in the gluteal region, or in the vastus externus muscle on the outer aspect of the thigh. The initial dose should be at least 500 units (U.S.A. standard); in heavily contaminated wounds, or when several days have elapsed since the injury, 1500 units must be given. The wound itself should be thoroughly cleaned up, all foreign bodies, clots, sequestra, and necrotic tissue being removed. Finally, the wound is thoroughly swabbed with tr. iodi. 1500 units of tetanus antitoxin must be administered intramuscularly at least four hours before undertaking any cleansing or operative measure, as in fresh tissues opened up by operation the absorption of toxin by the perineural lymphatics is extremely rapid, and tetanus has been known to develop within 48 hours.

The effect of a prophylactic dose of antitetanic serum lasts only ten days. If, therefore, the wound remains unhealed, further injections (500 units) may be given subcutaneously at weekly intervals, in order to anticipate the total disappearance of antitoxin from the body, until three or four doses have been administered. With such small doses of serum given subcutaneously at any interval of time the risk of anaphylaxis is negligible. When operations are performed at the site of previously infected wounds, even if soundly healed, it is advisable to give a prophylactic injection of antitetanus serum two days before operation.

Early Diagnosis.

Early diagnosis is of paramount importance. The classical symptoms described in text-books are those of a relatively late stage of the disease when specific treatment will have lost most of its value. The premonitory symptoms that at once should arouse suspicion are as follows:—

Sensation of stiffness in the posterior cervical muscles or in the jaws on opening the mouth widely; cramp or stiffness in the region of the wound; intense headache or backache; general restlessness, profuse sweating, and excessive yawning; sleeplessness, with anxious facial expression; hesitancy of micturition.

Early signs justifying a diagnosis of tetanus are:—

In the vicinity of the wound—muscular rigidity, painful cramps, or spasmodic muscular twitching (if the wound involves an arm or leg, the whole limb may show an occasional twitch). Difficulty or delay in swallowing or in opening the mouth, with increased tonicity on palpation of the masseters or muscles of the neck; increased rigidity of the facial muscles (spastic smile) and inability fully to protrude the tongue; increased reflex excitability—knee- and ankle-jerks, ankle-clonus, or slight muscular twitchings on pressure of the flexor tendons; difficulty in micturition; the occurrence of an occasional generalised spasm.

If any doubt exists it is far better to treat as tetanus; if the diagnosis is mistaken no harm will result.

Specific Treatment.

As soon as the diagnosis is made, the first dose of antitetanic serum should be given intraspinally. Animal experiments and clinical observations have shown that intrathecal administration ensures the antitoxin being brought into the closest possible contact with the nervous tissues involved, and in the shortest space of time.

Method.—Lumbar puncture is performed in the usual way, a general anæsthetic being advisable. The quantity of cerebro-spinal fluid withdrawn should exceed by at least 3 c.cm. the volume of serum it is proposed to inject. Serum containing 16,000 to 20,000 units (U.S.A. standard), warmed to body temperature, is administered, either very slowly with a syringe or by the "gravity" method, from a small sterile funnel and tube. High-potency or "concentrated" antitetanic serum should be used (Messrs. Burroughs and Wellcome supply phials of 10,000 units of concentrated antitoxin contained in 10 c.cm. of serum, and the Lister Institute phials of 20,000 units in not more than 25 c.cm. of serum.) A total volume of 30–40 c.cm. of serum can be injected provided that more than this quantity of cerebro-spinal fluid has been evacuated. The foot of the bed is then raised for three hours in order to assist the upward flow of the serum. It is also advisable to supplement the intrathecal injection by giving 8000 units of antitoxin intramuscularly in order to combat any toxin that may still be circulating in the blood stream. Intravenous injections of antitetanic serum tend to cause anaphylaxis and not are advised. The initial intrathecal injection of serum usually gives rise by the following day to a certain degree of "aseptic meningitis." The cerebro-spinal fluid if withdrawn will be found slightly turbid, showing numerous clear and well-defined polymorphonuclear leucocytes. The temperature rises, and the patient may appear actually worse, showing symptoms of meningeal irritation—photophobia and increased muscular rigidity of the neck and limbs. In cases where the tetanus is yielding to treatment, however, these symptoms will disappear in a few days. On the second and third day of treatment both the intrathecal injection (16,000 units) and the intramuscular injection (8000 units) should be repeated. Following this, intramuscular injections only may be continued—8000 units on the fourth day and 4000 units on each of the fifth and sixth days. Subcutaneous doses of 2000 units are then given every other day until the symptoms have abated.

There is practically no limit to the total amount of serum that can be given; I have administered as much as 150,000 units to a single severe case recovering in the course of 18 days. A serum rash appears within seven to ten days of the first dose of serum in most cases, and occasionally facial herpes; as a rule these conditions require no special treatment.

General Treatment.

The patient must be kept in bed in a darkened room with his back to the source of light, which is shaded. Absolute quiet is essential; even a slight noise will often provoke an exhausting painful spasm. Careful nursing is of the utmost importance, and the patient should be disturbed as little as possible. The temperature is taken in the axilla or groin, and when spasms tend to occur frequently, not at all. All dressings must be done quickly and deftly; laxatives given by the mouth are less disturbing than an enema. The nourishment should be fluid—milk and eggs, soup, beef-tea, brandy, &c.—and the patient spoon-fed. When trismus is pronounced, he is given liquid food through a straw or small rubber tube; nasal feeding should be avoided. For the painful spasms the best drug is chloretone given in 20-gr. doses three- or four-hourly; chloral (gr. 30 every four hours) is also useful and in tetanus superior to morphine; bromides are of little value. If the patient is unable to swallow, hyoscine (gr. 1/100) may be given hypodermically or chloretone (gr. 60) administered in solution per rectum; it may be necessary to resort to nutrient enemata, but their food value is very small. When spasms are frequent and severe, chloroform anæsthesia may be induced, especially if the respiratory muscles are affected.

Of other remedies that have been advocated there is no evidence that injections either of carbolic acid or of magnesium sulphate have any curative value.

Treatment of the Wound.

The advisability of surgical measures directed to the wound when tetanus symptoms first make their appearance is doubtful. Some surgeons have advocated opening widely or excising the wound, and when a limb is involved, even amputation—in the hope of arresting the absorption of tetanus toxin. In my experience, surgical operations during the course of tetanus do far more harm than good, and probably, by opening up perineural lymphatics for the absorption of further tetanus toxin, even aggravate the disease. It is safer to abstain from surgical activity. The wound should be syringed gently every three or four hours with hydrogen peroxide. An open dressing consisting of a single layer of gauze soaked in the peroxide should be placed over it during the intervals.

Local, Delayed, and Recurrent Tetanus.

Local Tetanus.—In those patients who have received one or more prophylactic doses of antitetanic serum tetanus may develop in a modified form confined to the vicinity of the wound. The symptoms may vary from mere local rigidity of the neighbouring muscles to a persistently tonic condition of a limb. Intermittent and spasmodic contractions may occur in the affected part. In all but the mildest cases, it is advisable to give an initial intrathecal injection (16,000 units) of antitoxin, followed by daily intramuscular injections of 8000 units until the condition subsides. The prognosis is good, but in a few untreated or inefficiently treated cases the tetanus becomes generalised.

Delayed Tetanus.—Tetanus may sometimes develop weeks after the original wound has healed, or the disease may follow some slight operative procedure and even a local injury. Recurrence of septic infection in a wound previously healed has also been known to be followed by tetanus. I have seen subacute generalised tetanus develop six months after a gunshot wound of the knee; the patient had received three prophylactic doses of antitoxin at weekly intervals following the wound and made a good recovery. The onset of delayed tetanus may be insidious and the condition may be general or remain localised. Trismus and neck rigidity has been known to remain slight for days and even weeks. As regards treatment, the principles detailed above should be applied according to whether the condition be general or local. The prognosis is good.

Recurrent Tetanus.—Occasionally in a patient who has previously suffered from tetanus as the result of a wound, tetanic symptoms may recur following an operation on the wounded area long after it has healed. The patient who has suffered from tetanus is never really out of danger while any foreign bodies or sequestra remain in the body. Tetanus bacilli have been cultivated from material removed from a wound as long as two and a half years after the injury. In cases of recurrent tetanus, as soon as the patient has recovered the wound should be excised and any foreign bodies and sequestra removed, cavities thus made being allowed to granulate up.

It is advisable before operating on a wounded area in a patient who has previously suffered from tetanus to give 15,000 units of tetanus antitoxin, after appropriate desensitisation, two days before operation.

Anaphylaxis.

In all cases in which an interval of longer than ten days has elapsed since a previous injection of serum (including those who are likely to have received a dose of horse-serum prior to the present illness), it is advisable to apply desensitising measures before giving a large dose of serum. Such anti-anaphylaxis is best induced by the method of Besredka and Friedberger.

5 c.cm. of the serum is diluted with 50 c.cm. of normal saline; 1 c.cm. of this mixture is injected intravenously; four minutes later this is followed by 3 c.cm. of the diluted serum, two minutes later by 10 c.cm., and after a further two minutes by 25 c.cm. Then in 15 minutes the full dose of serum may be given intrathecally, intramuscularly, or subcutaneously. The intravenous injections of the dilute desensitising serum can be given from a funnel and tube, the latter being pinched and liberated only to allow the required amount of diluted serum to escape into the vein.

Intrathecal injections are much less liable to be followed by anaphylaxis than are intravenous ones; the serum is not absorbed so quickly from the subarachnoid space into the general circulation as when injected directly into a vein. Through this slow absorption the patient probably becomes desensitised.

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Special Articles.

THE IMPORTANCE OF CORRECT POSTURE IN TREATMENT BY IMMOBILISATION.

BY T. E. HAMMOND, F.R.C.S. ENG.,
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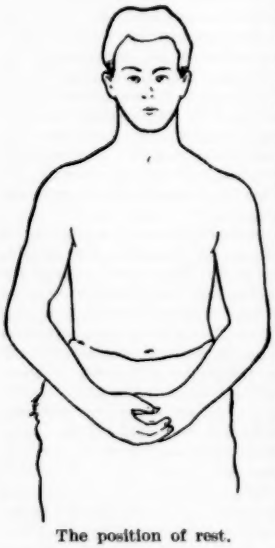
EVER since Hilton delivered his famous lectures on Rest and Pain, the placing at rest as far as possible of a diseased or injured organ has been regarded as a fundamental principle in treatment; if it is neglected, the best functional result is not attained. It often happens that a too zealous application of any form of therapy leads to its abuse, and treatment by rest is no exception. The prolonged rest of organs which are injured or whose nutrition is impaired does undoubtedly at times give rise to disastrous results. This was seen when fractures of the long bones were fixed by splints which were not removed until firm union had taken place.

FIG. 1.



The position of rest.

The resulting limitation of movement in neighbouring joints was out of proportion to the primary injury, and its degree was largely dependent on the duration of the immobilisation. The poor functional result was attributed to the prolonged rest. Consequently, there has been a recent tendency to decry its importance, and even to regard it as harmful. In the nerve lesions that were so common during the war, recovery of power was rarely seen in the muscles, in spite of perfect nerve surgery, until the teaching of Sir Robert Jones on the necessity for relaxing paralysed muscles was appreciated. By relaxation is meant the placing of a muscle at rest so that no strain is thrown upon it. When this line of treatment became popularised, the adhesions that sometimes developed were more marked than in the cases where it had not been carried out. Here again rest was condemned, but wrongly so, as adhesions did not form in cases where relaxation was properly applied.

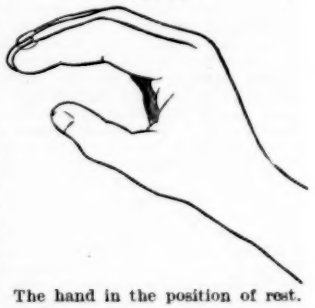
The true cause lay in failure to appreciate two essential principles. The first—with which I shall not here deal—is that complete rest is unnecessary after all inflammation has subsided or after repair has taken place, when activity, so graded that it is well within the capacity of the organ to perform and not of sufficient duration to induce fatigue, should be resumed. The second and more important is that, when one structure is placed at rest, no strain should be thrown upon any other. When an abnormal posture is taken up, the stretching of the muscles and ligaments leads to lengthening of the former and a constant strain upon the ligaments, which are inelastic. Paresis of the muscles follows, and a chronic irritation around the attachment of the ligaments that ends in an aseptic inflammation and the formation of adhesions. These are all the more marked if the nutrition of the limb is damaged or any septic process is present. Impairment of function becomes most evident in the hand, where the slightest derangement interferes with accurate and finely coördinated movements. Consequently, the harmful effect of any line of treatment will be soonest appreciated here, and it is largely with the application of rest in the treatment of lesions of the hand that this article deals.

The Position of Rest.

There is one position, the position of rest, in which all muscles, tendons, and ligaments are relaxed.

This position, which is assumed during ease and sleep, is that from which movement in any direction can be most easily started. Though varying with each individual, it approximates to a standard, and may for all practical purposes be described as follows.

FIG. 2.



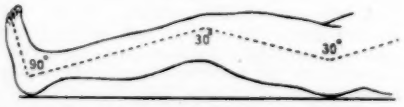
The hand in the position of rest.

In the erect attitude, when no accessory means of support is made use of, the forearm rests on the prominence formed by the great trochanter, which, by taking part of the weight, relieves the strain upon the muscles and ligaments. The upper arm is abducted 30° at the shoulder and is rotated inwards; the elbow is flexed to 120°; and the wrist is dorsiflexed 30° with the hand midway between pronation and supination. (Fig. 1.)

In the hand (Fig. 2) the fingers are flexed 30° at the metacarpo- and inter-phalangeal joints. The thumb is abducted 30° in a plane at right angles to the palm and is flexed 30° at both joints. Four main arches are present—a proximal and a distal transverse, and an inner and an outer longitudinal. The *proximal arch*, formed by both rows of the carpus and the bases of the metacarpals, has a dorsal convexity most prominent over the junction of the third metacarpal and the os magnum. The *distal arch*, formed by the heads of the metacarpals and most prominent over that of the third, is continued forwards to the tips of the fingers. With flattening of the latter arch the power of flexion of the fingers is lessened, with flattening of the former that of the thumb. The *outer arch*, formed by the outer portion of the carpus and thumb, arises at the scaphoid and passes forwards to the tip of the thumb. The *inner arch* is formed by the metacarpals and the phalanges of the fingers. The summit of both is over the heads of the metacarpals.

In the lower limb (Fig. 3) the hip is flexed 30° and is slightly abducted and everted, the knee is flexed 30°, and the ankle is dorsiflexed to a right angle.

FIG. 3.



The leg in the position of rest.

The position of rest is maintained to some extent by the ligaments and fasciæ, but chiefly by the postural tone of the muscles, the importance of which has been pointed out by Sir Charles Sherrington. It is sometimes stated that tonus is found only in the anti-gravity muscles. This is not the case, for, while it exists to a greater extent in these, it is also found in the opposing muscles. This is seen in lesions of the median and ulnar nerves, where, although the wasting of the muscles of the hand is partly responsible for the deformity, this is due chiefly to the unopposed tone of the extensor muscles and can be corrected by very slight force.

The position of rest can be maintained over long periods without the slightest discomfort or fatigue. This can be said of no other posture. Were the hand

to be immobilised in this position for several weeks, there would be no discomfort, and on removal of the splint full and forcible contraction of the muscles could immediately take place, showing that no strain had been thrown on any structure. Any other posture could only be maintained either by contraction of the muscles or by passive force, being associated with hyper-relaxation of one group of muscles and ligaments and stretching of the opposing group. Extension of the fingers causes an ill-defined feeling of strain over the palmar surface that passes into the forearm when the wrist is dorsiflexed, and is relieved by taking up the position of rest. It is also felt to a lesser degree over the dorsum, when the wrist and fingers are flexed. Were the hand to be immobilised in either position for some weeks, a dull pain would be present, and after removal of the splint there would be a slight though temporary weakness due to continued tension on the muscles and ligaments.

The knee may be taken as an example of the larger joints. When immobilised in the fully extended position there is a feeling of discomfort over the back of the joint which passes off when it is slightly flexed. In the former case the knee has been *placed at rest*, in the latter in its *position of rest*, the essential difference being that while the latter included the former, it also means that no strain is thrown on any structure round the joint, a point of great importance. Those who have had to stay in bed for a long period will have learned to appreciate the ease that follows the placing of a pillow under the knees, which places the legs in their normal position of rest.

In 1916 my attention was first drawn to the importance of posture in treatment. When injured organs are kept in the position of rest, not only does any inflammation present show a greater tendency to subside, but adhesions are not so extensive and can be more easily broken down. The most intractable cases are those in which it is evident from the deformity present that, though treatment by rest had been carried out, treatment in the normal position of rest had not. In the case of the hand, for example, the fingers had been fully or even hyperextended, with flattening of the palm and obliteration of the arches. After fractures of the femur much limitation of movement is generally seen when the knee has been kept extended; whereas if about 30° of flexion have been allowed, full movement is often present.

It can, therefore, be laid down as an axiom that in all cases of injury or inflammation, when rest is advisable, the injured and neighbouring parts must be placed in their normal position of rest unless some definite contra-indication is present—e.g., when, in fractures of the lower end of the humerus, the elbow has to be fully flexed. When a joint is involved in some inflammatory process, it becomes slightly flexed. This flexion increases later and so a definite deformity arises. In the early stages of all inflammations complete restoration of function should be the aim, which is best attained by keeping the joint in its position of rest. As the tendency is towards a flexion deformity, some have advocated that the joint should be held fully extended. I am certain, however, that such advice is wrong. When tuberculosis of the knee is treated with slight flexion, the inflammation tends to subside more quickly, abscesses are less likely to form, and the end-result is often good; when treated with full extension, the functional result is poor and complications are more common.

The Position of Ankylosis.

When it is obvious that destruction of the joint has taken place, limited movement is to be expected. In such cases the joint should be placed in the position that would give the best function should ankylosis occur. In the past there has been much controversy over the various positions that have been advocated. Yet it is quite easy to find out the optimum position by fixing one's own joints in plaster-of-Paris. In my opinion it generally corresponds to the position of rest.

Limited movement at a joint must necessarily give rise to some disability which will be partly compensated for by the increased movement that takes place in the neighbouring joints, especially if the patient is in early life. Recently I saw a pensioner, aged 25, who had a cross union between the ulna and radius of seven years' duration. He was unable to pronate or supinate the hand when the elbow was fixed. Yet when the latter was free, the rotation of the hand was almost equal to that seen in the normal adult, owing to the increased rotation acquired at the shoulder. The position of an ankylosed joint should throw as little strain as possible on the neighbouring joints, a point of much importance in the lower limb, where the constant strain is apt to set up an arthritis.

When the thumb and fingers are ankylosed in the position of rest, not only can objects be easily grasped, but the remaining digits can be readily opposed. Dorsiflexion to 30° is essential at the wrist, as full forcible contraction of the flexors can take place only in this position. The position of an elbow should depend largely on the occupation pursued. In the labouring classes flexion to 100° with the hand slightly pronated, and in women flexion to 75° with the hand slightly supinated, are probably best. When circumstances permit, it is well to fix the normal elbow in plaster for a short time, so that the patient can appreciate what is happening; full consideration should always be given to his views. Limited movement at the shoulder is partly compensated for by the movement of the scapula on the chest wall. When the shoulder is ankylosed with the arm abducted 60° and the elbow in front of the line of the body, the arm can be brought to the side, and abduction to 120° with a certain amount of flexion and extension are possible.

Since the lower extremity has to support the weight of the body, strength and stability are essential. Much time is, however, spent sitting down and at rest. When the hip is ankylosed in the position of rest, full extension and flexion to 70° may seem to be present. But this is only apparent and takes place through the movement of the spine. As a result, on standing the hip and neighbouring joints are in the position of rest; on walking the thigh can be brought into line with the body; on sitting moderate comfort is possible. When ankylosis takes place in full extension, as is sometimes recommended, sitting is most uncomfortable, and on standing there is constant strain upon the neighbouring articulations. The knee should be ankylosed flexed 30°, as this allows full movement at the ankle and hip on walking; when ankylosis takes place with full extension, dorsiflexion at the ankle is limited. The ankle should be ankylosed at a right angle, as the modern heel allows the knee and hip to be maintained in the position of rest on standing; and, as the whole of the sole of the foot is in contact with the boot, the weight is transmitted in the normal manner.

PENSIONS FOR HOSPITAL OFFICERS AND NURSES.

II.*

IN the preceding article the general outlines of the proposed scheme to provide pensions for hospital officers, including nurses, were given; we have now to come down to actual figures, dealing first with individual cases and finally with the total cost as it would affect the institutions.

Let us look first at the scheme from the point of view of an officer of the senior class, entering at age 20 upon hospital service, with a salary of £100 and emoluments of £30. At the outset he would pay £6 10*s.* a year out of his salary, and the hospital would pay £13 in his respect. It may be assumed for purpose of illustration that the officer's salary gradually rises by increments of £10 until he is receiving £200 a year at age 30—i.e., £230 in all at that point, and that thenceforward he enjoys his increases of £20 and, eventually, increases of £30, so that he reaches £780 in all by the time he is aged 50. We should then find

* Part I. appeared in THE LANCET last week.

his annual contribution gradually rising pari passu with the salary to £39 a year, while the contribution of the hospital would gradually mount to £78 a year. As each addition to salary came into being, so would a new or increment policy be automatically effected. Even in the case of an Endowment Assurance, this would necessitate no medical examination after the initial one, and, of course, where the Deferred Annuity option was selected no examination would be necessary at any time, seeing that the option does not carry with it a death benefit in the way in which an Endowment Assurance does, for the amount paid at death really represents only the accumulated value of the payments which have been made.

Now, that initial annual payment of £19 10*s.* predicated here—viz., the £6 10*s.* from the officer and the £13 from the hospital—would provide for the hospital officer a Profit Endowment Assurance of £828, payable at age 60, or at previous death, with estimated Reversionary Bonuses gradually accruing and amounting at the end of the period to a further £558. As each increase in his salary throughout his service, carrying with it (as it would) the increased contributions, would gradually augment the amount insured and the accompanying bonuses, he would see the initial policy of £828 increased stage by stage to a total of £2689, and the ultimate bonuses standing added to the Policy at age 60 similarly increased to £1499. There would thus be a grand cash total at retirement of £4188, which sum would, if the pension option were selected, purchase an Annuity from age 60 of £354.

Under the foregoing Endowment Assurance option it must be clearly understood that the death benefit throughout the service is one of very considerable magnitude; to give an idea of its amount, if death occurred at age 35, there would be probably some £2000 payable to those whom he left behind him; if death occurred at age 40, the sum would be £700 or £800 more than that. If the officer, instead of selecting the Endowment Assurance option preferred to take that of the Deferred Annuity with return of premiums in the event of death, he would, if he lived out the full period, have amassed at the end of the time £5111, which would provide a pension of £441 10*s.* from the attainment of age 60 until death. In other words, by forgoing the valuable death benefits of the Endowment Assurance policy, and preferring a Deferred Annuity, a larger eventual pension is secured. This is, therefore, a better option for the man who is unmarried, or rather—an important proviso—for the man who is confident that he will remain unmarried throughout his service!

In a similarly typical case in the clerical or dispensing staff, where the salary and emoluments might run from £130 up to a limit of, say, £480 at age 50 or over, we have an initial sum of £6 10*s.* payable by the official and £13 payable by the hospital, gradually increasing as small additions are made, until at age 50 the contributions would be £23 10*s.* for the officer and £47 for the hospital; these would serve to produce an ultimate cash sum, represented by the Endowment Assurance policies and bonuses, of £3222, with a pension option of £272. The Deferred Annuity, while again giving far less if death occurred before pension age, would yield a cash sum of £4029 at maturity and so provide a correspondingly high pension.

As a third test we may take the case of a member of the nursing staff, beginning as a staff nurse with an average salary of £60 and emoluments of £50, passing through the stages of a ward sister with a salary gradually rising to £115, with emoluments of £60, and thereafter becoming a home sister, and eventually an assistant matron with a finishing salary at that stage of £220, with emoluments of £80. We may follow her career further, until, as a matron, she finishes with a salary at £300 and emoluments at £150. At the outset we will credit her with £20 to represent the accumulations made during her period of training, and will apply them in the form of a single premium to increase the amount of her benefits; taking this into account, and the fact that she begins by paying £5 6*s.* 8*d.* a year, where the hospital pays £10 13*s.* 4*d.*, her contributions gradually rising as she progresses until finally she is paying £22 10*s.* and the hospital £45; and we see that the result is that by age 55 there will be available a total sum of £1571 made up of the Endowment Assurance policies and bonuses, with a cash addition of £224 made up of the contributions paid during the few final years of service where the term is too short to admit of further increment policies under with profit Endowment Assurance tables, and thus bringing the total cash to £1795, which total in turn would provide an annuity of £118 6*s.* Here again the Deferred Annuity option would give a greater pension at the expense of lessened death benefits; for it would give an ultimate cash sum of £2036 instead of £1795. Moreover, in such a case as this illustration, choice would as a rule wisely fall upon the Deferred Annuity, for the woman's problem differs from that of the man unless she has others definitely dependent upon her. Indeed, nearly all nurses are likely to take Deferred Annuities since, for the rank and file, pensions to begin at age 55 are so expensive that the amounts will be none too great in any case.

The Cost to Hospitals.

To get an idea of the cost of the scheme, if it were adopted as a whole, an example may be given of the figures as they would be applicable to a typical general hospital in the metropolis, containing between 500 and 600 occupied beds as an average. The number of employees within the limits of the scheme in such a case would be about 272, and the total salaries and emoluments £38,300, so that the hospital's annual contribution would be £3830. Taking as an instance a small institution, say, a special hospital with between 30 and 40 average occupied beds, we should find 22 employees within the scheme, with total salaries and emoluments of £3191, and an annual cost to the hospital of £319.

The memorandum, which was drawn up by King Edward's Hospital Fund for London and three other associations and circulated amongst the hospitals, points out that in the year 1924 there were 64 voluntary hospitals in London with surpluses altogether amounting to £280,000, and 54 hospitals with deficits amounting to £118,000, and certainly the statistics of the last five years do show that the number of hospitals with surpluses is steadily increasing and the number of those with deficits is steadily decreasing. There is, however, no burking the fact that, as we stand to-day, there are nearly as many hospitals with deficits as there are with surpluses, and no general statement that the hospitals, as a whole, are in an improved position is very comforting to those whose accounts are still upon the wrong side. It is true that in 1920, 1921, and 1922 the voluntary hospitals of London showed a net aggregate deficit for the year, first of £385,000, then of £214,000, and then of £177,000, whereas in 1923 there was a net aggregate surplus of £227,000, and in 1924 one of £162,000, from which the general improvement is evident, even though the 1924 figures indicate that improvement is not yet to be counted upon too exactly. The individual hospital, however, must cut its own coat according to its cloth.

One is compelled to come to the conclusion that for a very large number of hospitals the whole scheme in its entirety is an ideal which is at present beyond their powers, unless they are to be in some way very greatly assisted from outside sources. This, however, is not to say that it is impossible for them to make a beginning, and it would seem better to make that beginning from the top—that is to say, with the senior officers, matrons, and so on—rather than at the other end where you have the nursing probationers.

Looking at the figures with regard to the nursing class we find that a careful analysis has been made of 500 probationers who entered hospital for training between 1908 and 1914. Of these no less than 194 got married, 61 dropped out from death, ill-health, or from one cause and another, and only 245, less than

half the total, went on with nursing work. Even of that number only 49 actually received hospital appointments, the rest obtaining appointments in such spheres as nursing homes or schools, or going into welfare work or missionary work, or the Army Nursing Services.

Such figures as these force a realisation that this large part of the scheme, involving as it would do an immense organisation and great difficulties with regard to the cost, both for the hospitals and the individuals, must really miss fire so far as more than half the persons embraced in this category are concerned. Those who frame such schemes as this are almost invariably attracted by the ideal of completeness, and always there is reluctance to admit that completeness is not possible; but, where the resources of a hospital are very limited, it is this end of the scheme that must be abandoned for the present as being the least effective use of the available money. To do something to place upon a safer footing the eventual provision for the old age of the senior officials, those who are giving their lives to hospital work and are the teachers of this branch of the profession, is something to effect which every possible strain must be borne.

With regard to the nursing profession, the view of one who comes from other spheres of work to the consideration of the matter is that the wages paid to women are too low. What are called emoluments in this connexion are simply such board and lodging as we all give in our homes to the ordinary domestic servant; but to domestic servants to-day we pay far higher wages than are paid to nurses working in the hospitals.

THE TUBERCULOSIS CONFERENCE,

CAMBRIDGE, MARCH 25TH–27TH.

A JOINT conference of the Tuberculosis Society and the Society of Superintendents of Tuberculosis Institutions was held at Cambridge from March 25th to 27th.

The opening session was devoted to a discussion on

Ultra-violet Rays and Tuberculosis.

introduced by a paper read by Dr. JAMES CROCKET, medical superintendent of Consumption Sanatoria, Scotland. Dr. Crocket gave a systematic account of the four groups of radiation known to have therapeutic properties, the lamps in general use, and the physiological and therapeutic effects of their action, the suitable and unsuitable types of case, and the general signs of intolerance. Contrary to the general opinion, he had not found ultra-violet radiation to be necessarily contra-indicated in pulmonary tuberculosis. With adequate precautions, especially with care to have the patient in the recumbent position and exposed to as little risk of fatigue as possible, improvement had been effected in 85 per cent. of cases as compared with 67 per cent. improvement by ordinary methods. Dr. Crocket stressed the point that ultra-violet radiation should never be allowed to become a substitute for the recognised hygienic treatment of tuberculosis. He also thought that it was high time we found a more comprehensive and accurate descriptive term than ultra-violet radiation and suggested phototherapy or electrotherapeutic radiation. In the discussion which followed the two most important points emphasised were those of immobilisation of the part and ventilation of the lamp room. Apparently it has been the practice in some institutions to remove the splintage from limbs during light treatment and thereby undo the good effects of immobilisation. Ventilation of the lamp room was considered a much-neglected point.—Dr. J. G. JOHNSTONE (Heatherwood) stated that in the course of visits paid to many institutions in Great Britain and on the continent he had found a great neglect of this all-important principle. Lamp rooms sometimes had no ventilation at all, and tuberculous patients were submitted to a temperature which produced a condition little short of heat-stroke. He considered that it was this overheating and lack of ventilation which was responsible for the recorded cases of hæmoptysis following light treatment. From the discussion it seemed clear that institutions installing a light plant must not in the future be satisfied with devoting some odd waste corner of the building to this object, but must make the same careful preparations as were necessary in building an operating theatre or other special department. The important and much neglected question of daily measurement of the ultra-violet rays and the various methods in use for this purpose seemed entirely to escape the notice of the conference. It would appear to be one of the next steps in getting really accurately controlled results of treatment.

Later in the afternoon Dr. G. MARSHALL, assistant physician to the tuberculosis department of Guy's Hospital, read a short paper on

Tuberculosis and Pregnancy,

dealing with the subject from the point of view of the effect of the pregnancy on the tuberculosis. Of the cases of pulmonary disease referred to his department by the antenatal clinic at Guy's, Dr. Marshall had collected 13 non-tuberculous and 25 tuberculous cases, most of them occurring in the early months of pregnancy before the mechanical factor in causation was of much account. The majority of the tuberculous cases had been made worse by the pregnancy, and Dr. Marshall considered that modern opinion had reversed the old dictum that pregnancy was a good thing for the tuberculous girl. It seemed possible that there was a biochemical factor at work in these cases which was not yet understood. His opinion, in the light of the experience so far gained, was that wherever possible sterilisation of the patient should be effected, and where the pregnancy was terminated by Cæsarean section this was not difficult to do. In the subsequent discussion there was a general consensus of opinion that pregnant women reacted exceptionally well to sanatorium treatment, that labours were generally easy, and that in considering the future of the patient the ordinary rules of prognosis in tuberculosis must prevail. Cases were quoted by various speakers showing both the bright and the dark side of this clinical picture, and it was evident that personal experience of different types of case had led tuberculosis experts to hold divergent views on the subject. Probably this method of deduction from particular groups of cases contains an old fallacy—the difference in the economic and environmental factors in different groups of cases. Obviously the hospital out-patient class of woman is in a very disadvantageous position psychologically, economically, and environmentally, as compared with the middle-class woman or even with the agricultural labourer.

On the following morning the conference turned its attention to a consideration of

Catarrho-pyogenic Infections and Tuberculosis,

the subject being introduced by Sir HUMPHRY ROLLESTON. The inter-relation of these two types of infection raised many difficult questions. The time relations of the two infections, the old "dualistic" conception of consumption of Virchow's day before the discovery of the tubercle bacillus, the delayed appearance of the tubercle bacillus in closed lesions all combined to make the problem a very thorny one, and the speaker thought it unwise to adopt Dr. Batty Shaw's appeal for a new nomenclature in the present state of our knowledge. Such a course might obscure the primary underlying factor of the disease.—Dr. BATTY SHAW continued the discussion. He based his argument on the well-known mortality curve for tuberculosis which showed a sharp rise in infancy, an equally sharp fall after 5 years of age, a flat low plateau until the age of 10, and then a gradual rise through the period of puberty, adolescence, and early adult life. In this second period of high mortality Dr. Batty Shaw considered that catarrho-pyogenic infection played a most important part, acting as a liberator of the tubercle bacillus. The

latter did not, when unassociated with catarrho-pyogenic organisms, produce pus formation, caseation, and resultant hæmoptysis. The discussion which followed these two papers ranged over many different aspects of the subject and obviously no conclusion was possible. Most speakers agreed that the catarrho-pyogenic organisms had to be reckoned with as causative factors in tuberculosis, but exactly how and when they entered the field it was premature to decide. Most of the evidence produced was purely clinical and therefore of necessity incapable of being put to an accurate scientific test.

The rest of the session was given up to a paper by Sir STCLAIR THOMSON on the indications, technique, and results of

Galvano-Cautery Treatment of Tuberculosis of the Larynx.

He gave the results of 14 years' observation of cases of phthisis at Midhurst and recorded his figures as regards both incidence of laryngeal disease and galvano-cautery treatment. He insisted that a preliminary period of three months' observation was essential before local treatment of the larynx should be attempted. When this rule was observed the results were striking. Of all patients seen at Midhurst 17·5 per cent. showed laryngeal involvement, 16·6 per cent. of the latter proved suitable for galvano-cautery treatment, and of these again 64 per cent. showed arrest of the lesion after treatment.—In the discussion which followed Dr. R. R. TRAIL (Midhurst) emphasised the value of a laryngologist's report in prognosis of cases of pulmonary tuberculosis. As regards local cautery treatment, he believed the economic factor and the personality of the laryngologist were most important, the former because of the long preliminary period of observation in sanatorium which was necessary, the latter because the emotional excitement of the tuberculous patient who had to undergo cauterisation needed careful and reassuring handling.

At the afternoon session Prof. S. LYLE CUMMINS read a paper on

Sanocrysin.

He considered that rightly used the drug had some beneficial action. He discussed the various problems associated with its administration—viz.: (1) the effect of sanocrysin in liberating tubercle toxin, (2) the gold-ion toxicity of the drug, (3) the accessibility of the tuberculous lesion, (4) the resistance of the patient, and (5) the elimination of the drug from the body. Given a good general condition and a controllable temperature, Prof. Cummins thought the drug was definitely useful, but there were many cases where its use was contra-indicated. Radiograms were essential in interpreting its effects. Dosage was still in its experimental stage; in apyrexial cases he began with 0·25 g. and in pyrexial cases 0·2 g. Inman's classification based on the toxæmia factor was most useful in selecting cases. Prof. Cummins also described the technical details of administration, and stated that it was not uncommon for patients to be made worse for the first fortnight after treatment was instituted and then steadily to improve. Pyrexia, anorexia, giddiness, and even vomiting were not uncommon at first, but passed off. The really serious danger signals were (1) sudden reduction of urine, (2) stomatitis, (3) intestinal disturbance, (4) a tendency to sweating, and (5) persistent albuminuria.—Dr. F. G. HEAF described a series of cases he had treated with small doses beginning with 0·1 g., and stated that he believed the small dose method was the most useful.—The discussion on sanocrysin was very short, the conference evidently feeling that the data were too few for general discussion, and the session terminated with a demonstration by Dr. PARRY MORGAN of his special type of artificial pneumothorax apparatus.

The last session of the conference, on Saturday morning, was spent in considering artificial pneumothorax technique and apparatus. Various new types of apparatus were described and end-results (especially in children), and the problems of gas embolism, pleural shock, &c., discussed.—There were also three short communications of very considerable interest from Mr. H. MORRISTON DAVIES, Dr. S. VERE PEARSON, and Dr. L. S. T. BURRELL.—Mr. MORRISTON DAVIES explained the use and value of phrenic nerve evulsion associated with artificial pneumothorax, by means of which the effect of collapse therapy could be supplemented by paralysing and thereby raising the diaphragm, and resting more efficiently the affected lung and rendering pleural effusion less liable to complicate matters. Dr. PEARSON described the phenomenon of mediastinal bulging following collapse therapy. This was frequently found to be present when the patient received more gas at a refill than was anticipated, and on examination by radioscope the gas was found to compress the lung to a very small extent. In these cases there was frequently bulging in the posterior mediastinum, which could be seen on the fluorescent screen in the right oblique position, possibly associated with displacement of the middle mediastinum and sometimes, though not always, giving rise to undue dyspnœa. In this connexion it may be noted that the various phenomena and mediastinal movements were briefly described by Prof. Rist, of Paris, at a discussion at the Royal Society of Medicine a year ago. Dr. BURRELL gave statistics showing the prevalence of pleural effusion in 309 cases in which he had induced artificial pneumothorax. In approximately 41 per cent. of cases this complication had been found to occur sooner or later. Various mechanical explanations had been brought forward to account for the complication, but Dr. Burrell thought that the cause was to be found in the reaction of the tuberculous foci in the lung and pleura, since effusion only rarely occurred in cases of collapse therapy performed for non-tuberculous disease of the lung.

Public Health Services.

TYPHUS FEVER IN ST. HELENS.

THE case of typhus fever notified from Sunderland is the first to be brought to light since the small outbreak of this fever which occurred in St. Helens during August and September, 1924, and is described by Dr. Frank Hauxwell in a recent report. He reminds the health committee to which it is addressed that in 1875 typhus fever caused no less than 1500 deaths in England, that it is still prevalent in Eastern Europe, especially in Russia, and that "it is still not uncommon in Ireland." The previous outbreak reported in England was in Birkenhead in February to March, 1922, when there were 12 cases, three of which were fatal. The usual carrier of infection is the body louse, but fleas, bugs, and head lice also serve. Lice after absorbing infected blood retain their infectivity for three or four days, and should they lay eggs during this period the insects hatched from these eggs may transmit the infection. To how many generations this may be carried is, Dr. Hauxwell states, not yet known. The first St. Helens case was discovered on August 12th, when a girl of 14 was sent to the isolation hospital with the notification of measles. The symptoms suggested typhus and the diagnosis was confirmed by Dr. W. Hanna, medical officer of the Port of Liverpool. The girl died three days after admission. On further inquiry the father was found to be under treatment for influenza and to be an undoubted case of typhus. He was removed to the hospital and recovered. Another child from the same house had contracted an illness a month previously, for which she had been treated for pneumonia in the Providence Hospital, whence she was discharged cured on August 10th. An examination of her blood left no doubt that she had suffered from typhus, and was the first known case of the outbreak. The home of this family was not in bad condition structurally, but was verminous.

On August 25th another girl in this family took the illness and recovered. On the same day the mother became ill and died a fortnight later. The other three cases were a sister-in-law and her son and a contact. The outbreak affected in all eight persons, of whom four died, and was confined to three households within 50 yards of one another. One of the points noted was the reluctance of the contacts to admit feeling ill. Thus the sister-in-law said she was perfectly well until she had a temperature of 103° F., and was a well-marked case. She was removed to hospital the same day and died five days later. It would appear, therefore, to be necessary to take the temperature of contacts and not trust to their expressions of well-being. No cause could be suggested for the outbreak, but the neighbourhood affected was one in which Irish visitors are not uncommon.

THE FIRST SCHOOL MEDICAL REPORT.

The annual reports of school doctors are (or ought to be) human documents, addressed to the lay public through their education and public health committees, showing the progress in the well-being of school-children, deducing from past experience the road along which progress has been made, and outlining the route for further advance. Each committee looks to its expert medical adviser for guidance in the direction in which further efforts should be concentrated, and honest doubt is arising whether the time spent over routine weighing and measuring of all children or on duplicated examination of teeth by doctors and dentists is time well spent. Apart from remedial work, advance is to be seen in the rapid decline of personal uncleanliness and of dirt diseases associated with the modern tendency towards short hair, loose neckwear, and lighter and shorter clothing. The year 1924 was noteworthy for the wide outlining of excellent schemes of betterment; more open-air schools and classes were advocated, extensive preparations were being made for supervision of abnormal children, games, orthopædic and special centres were being planned, when Circular 1371 intervened and the surveyed road of advance will now require re-surveying before engineering can begin. In the first report for 1925 which has reached us Dr. A. H. G. Burton, of Ilford, laments that his hope for an open-air school has not been realised, nor that for a centre for mentally defective children, nor that of an orthopædic centre for treating the 311 children requiring such attention. In Ilford there are 185 pre-tuberculous children for whom no special provision is made, yet the high cost to the country of treating the case of developed tubercle compares badly with that of preventive open-air classes and schools. It takes long for economists to appreciate that prevention is the cheaper and sounder method. Credit is due to Dr. Burton not only for his early report, but for the excellence of the results shown in his routine work.

MENTAL HOSPITAL REPORTS.

THE *Royal Albert Institution for the Feeble Minded*, instituted in 1864 for the benefit of the feeble-minded of the Northern Counties, has issued its sixty-first annual report, which was approved by a general meeting held at the Town Hall, Rochdale. At a public meeting held the same evening Lord Richard Cavendish stressed the voluntary basis of the Institution and the care devoted to the teaching and training of the inmates as well as to their occupation and amusement. Since 1870 4386 patients of both sexes have been admitted, of whom 10 per cent. have become practically self-supporting under friendly supervison. Scarcely any case leaves the Institution unimproved. Accommodation has now been provided for 800 patients in the main building and its dependencies. Employment on the estate and farmlands of 277 acres provides healthy occupation, and there is a dairy farm and farm colony for 40 youths who work on the land or tend cows, pigs, and poultry. Industries and handicrafts are carried on in a system of workshops. The girls assist in a variety of domestic occupations. Dr. W. H. Coupland's eleventh medical report mentions a total of 798 patients, 536 males and 262 females. Fifty new patients were admitted during the year and 33 cases discharged, while 27 (15 males and 12 females) had died. This exceptionally high death-rate followed an exceptionally low one in the previous year, the average mortality of the past 25 years not having exceeded 2·55 per cent. of residents. An epidemic of influenza had involved 240 patients and 16 of the indoor staff, amongst whom was a charge nurse who died. Besides influenza, outbreaks of German measles, measles, chicken-pox, and whooping-cough had seriously hampered the special training arrangements of Miss Gresham and her staff of teachers. The open-air school recently added had proved valuable. The useful work done in this Institution continues to retain the benevolent interest of the northern public.

The 113th annual report of the *Royal Hospital* at *Morningside, Edinburgh*, records a successful year of work in 1925 on an average of 830 resident patients drawn from all classes of the community and including a high percentage of voluntary boarders. In addition to the four nursing homes in the suburbs for the use of patients under their own medical attendants, each adapted to its special type of case, a convalescent home in the country is to be opened this year. A mental out-patient clinic at the Royal Infirmary is to be opened this month to investigate and advise on all sorts of difficulties and complaints in which mental instability or weakness is believed to play a part. Here the ideal of prevention will be aimed at. Possibly to be run in conjunction with this clinic, which will have no infirmary beds at its disposal, the managers hope to open a "Jordan Burn Hospital" to provide for about 48 cases of early and mild forms of mental trouble among the hospital-patient class. A public appeal is to be made for funds to finance this extremely desirable institution.

The *Aberdeen Royal Mental Hospital* has about 800 certified patients and 30 voluntary boarders. The recovery-rate for 1925 was 27·7 per cent. and the death-rate 6·83 per cent. No more cases of typhoid occurred, and the extensive search for a carrier responsible for the 1924 cases met with no success. A visiting dental surgeon was appointed during the year and an occupational therapy department was opened. A graduate of the College of Occupational Therapy in Philadelphia was appointed instructress and the department appealed at once to a large number of patients. The medical superintendent remarks that "it was most instructive to observe the gradual development of interest in some melancholic and demented patients." The work includes the making of rugs, raffia and cane-baskets, teapot stands, trays, toys, and needlework, designing, painting, block printing, leather and metal work. The success of the venture is indisputable.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 20TH, 1926.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 189 (last week 212); scarlet fever, 1544; diphtheria, 1115; enteric fever, 51; pneumonia, 1142; puerperal fever, 53; cerebro-spinal fever, 9; acute poliomyelitis, 4; encephalitis lethargica, 45; typhus fever, 1; dysentery, 5; ophthalmia neonatorum, 105. No cases of cholera or plague were notified during the week.

The case of typhus fever was notified from the county borough of Sunderland. Dr. E. Thorp, deputy medical officer of health for the borough, informs us that the source of infection has not yet been definitely ascertained. The victim was a child of 3 years of age, and it is interesting to note that a woman in the same house died of pneumonia and meningitis a month previously, the crisis being on the twelfth day.

Deaths.—In the aggregate of great towns, including London, there were 3 (0) deaths from enteric fever, none from small-pox, 116 (56) from measles, 12 (2) from scarlet fever, 43 (1) from whooping-cough, 49 (17) from diphtheria, 53 (22) from diarrhœa and enteritis under 2 years, and 136 (19) from influenza. The figures in parentheses are those for London itself. The notified deaths from influenza are higher than in any previous week of the year.

Correspondence.

"Audi alteram partem."

A STATE MEDICAL SERVICE.

To the Editor of THE LANCET.

SIR,—A principal recommendation of the recent report of the Royal Commission on National Health Insurance was quoted in THE LANCET last week as follows: "The ultimate solution will lie, we think, in the direction of divorcing the medical service entirely from the insurance system, and recognising it, along with all the other public health activities, as a service to be supported from the general public funds." The view of the Commissioners will surprise those who have thought the question of nationalisation was moribund.

A fugitive interest was aroused in it, when within half an hour on a recent morning a youngish consultant and a retail chemist both expressed the opinion that State conduct of their respective professions must eventually come, and the sooner the better. I met the chemist again in the evening and found the imminence of a State service to be then appreciably less. Business was better, and a comparison of receipts as from Jan. 1st had revealed an unsuspected surplus of £47 over last year.

It has long been recognised as a weakness of democracy that whereas in theory the majority rule and order the manner of their existence, in practice compactly organised and sufficiently vocal minorities often impose their will upon the inarticulate mass. Ephemeral difficulties or even the personal embarrassments of the moment are not infrequently at the root of the unreflective advocacy of far-reaching social experiments which hold the promise of a material reward. This is an attitude we can readily understand and, up to a point, even sympathise with. To the majority of mankind material advancement is the most cherished good. But the public advocacy of a State Medical Service is never based upon grounds of self-interest, for social reformers are invariably altruists who live and move in a rarefied atmosphere of spirituality and are concerned only for the welfare of others. The private practice of a profession is quite properly categoried amongst the precarious livelihoods. Actually it is no more speculative than the conduct of a trading enterprise, where equally there must be a high percentage of failure or indifferent success. It is precisely the sporting or speculative character of a competitive undertaking which constitutes not a little of its lure for the energetic and capable; and the efficient speculator is never poor.

To function successfully a State service would require to substitute something for the competitive interest and the desire for realisation which spur the individual practitioner to greater effort. In short, it must contemplate the enrolment of idealists to whom the pursuit of knowledge and truth is in itself an end, and the reward of industry the consciousness of well-doing. The supply of genuine idealists being restricted, the service as constituted would presumably embrace a certain number of idealists together with a much larger number of scientists whose conception of the greatest good is a safe and pensionable £600, an eight-hour day, and a semi-detached suburban villa called "Chez Nous." The actual factor, however, which determines the advent or otherwise of a State Medical Service is economic. The proponents of such a service manifestly accept the perpetuation of inadequate industrial wages and low purchasing power, for in the presence of the reverse conditions it has no status. It is generally believed that commodity prices will become stabilised at about 140, a figure now reached, but wages, monetary and real, cannot remain at present levels if the country is to return to prosperity, as it unquestionably will. Both employers and the responsible Labour leaders recognise that under prevailing world conditions high wages are the concomitant of high productivity, which alone enables manufactured articles to be sold at competitive prices. With the stabilisation of piece-work rates, the use of modern plant, and the removal of hampering trade-union restrictions the skilled mechanic within ten years will be earning £10 weekly and ordinary labour probably a pound a day. This will involve a considerable decrease rather than an increase of present State medical commitments.

History shows that periods of individualism regularly alternate with periods of socialism, each representing a reaction from extreme positions reached by the opposing humanistic theory. In 1920 many believed that a State Medical Service was at least within the bounds of possibility. This phase passed, leaving behind an unwelcome legacy of social services and salaried posts. We are now at the beginning of a period of intense and hopeful individualism.

I am, Sir, yours faithfully,

H. D. L. SPENCE.

Great Russell-street, W.C., March 29th, 1926.

WHAT IS ORTHOPÆDIC SURGERY?

To the Editor of THE LANCET.

SIR,—A perusal of the February Transactions of the Orthopædic Section of the Royal Society of Medicine prompts me to ask through your columns the question: "What is orthopædic surgery?"

The cases shown in the Section included two of Charcot's disease, one of osteomalacia, and one of secondary ovarian sarcoma of the scapula, treated by inter-scapulo-thoracic amputation. The first three cases possess only a minor and incidental orthopædic interest and the last one, so far as I can see, none at all. We have travelled far from the time when orthopædic surgery was defined as the branch of surgery which deals with the deformities arising during the process of growth, and the subject still appears to be expanding indefinitely.

The recognition of a specialty in surgery is the result of an implied bargain, made in the public interest. On the one hand, the general surgeon acknowledges the superior knowledge of the specialist based upon long and exclusive devotion in hospital practice to his particular subject. The specialist on his side agrees to restrict his activities within the limits of his specialty. In cases such as those referred to I do not think orthopædic surgeons possess any special knowledge or experience. I doubt, in fact, whether their experience in such fields is equal to that of the general surgeon, and it appears to me that such cases should not be shown in a specialist Section of the Royal Society, but before the main Surgical Section, where they could be considered from a broad point of view, and in all their aspects.

When cases are shown publicly in a specialist Section, there is a clearly implied claim to superior skill and knowledge in their treatment. Cases in which this claim cannot be substantiated should be excluded. Alternatively, I think the Orthopædic Section should apply for absorption in the main Surgical Section of the Society.

I am, Sir, yours faithfully,

W. SAMPSON HANDLEY.

Harley-street, W., March 23rd, 1926.

AN ESSAY IN EXPERIMENTAL EPIDEMIOLOGY.

To the Editor of THE LANCET.

SIR,—May I make one comment on the leading article which appears under the above heading in last week's issue of THE LANCET? In my first Milroy Lecture I said: "Many of the results which I wish to lay before you are . . . . the outcome of a joint investigation, for which Dr. Greenwood and I are equally responsible." If I may be allowed two other quotations from the same lecture, they will, I think, make clear the position as it appears to us both.

"It is not enough that the statistician should analyse the results obtained by the bacteriologist. He must take a full share in designing the experiments and in following their course."

"At the present moment, we believe that the best hope of elucidating the main questions at issue is to combine the experimental and statistical methods, by developing an experimental biometry of epidemic disease, in which the bacteriological and immunological factors shall not be so complex, and so little susceptible to control, as to defy analysis, while the numerical data shall not be so slight as to preclude the application of statistical methods of inquiry."

Dr. M. Greenwood's share in the work is, of course, perfectly obvious from the context of the lectures, and I would not trouble you in the matter were it not that I have a very lively faith in the promises held out by a closer coöperation between the two methods of research. Team-work is not a magician's wand, potent to resolve all our troubles and perplexities; indeed, it can quite easily be overpraised and overdone. But from time to time occasions arise in which it becomes clear that successful attack on a particular problem requires the application of two technical methods, neither of which can be acquired easily or quickly, and which are not, in fact, at the disposal of a single individual; while two or more persons, possessing in their joint capacity a combination of technical experience which neither can command alone, may have a sufficient common stock of knowledge and ideas to see the same problem in much the same light. Under such circumstances team-work becomes natural, and therefore easy and profitable. There is, I think, little doubt that the study of epidemic disease offers one such occasion to the bacteriologist and the biometrician. I shrewdly suspect that many of the problems of infection and immunity, not usually included in the domain of epidemiology, would yield to attack along similar lines.

I am, Sir, yours faithfully,

Manchester, March 29th, 1926. W. W. C. TOPLEY.

V.D. CLINICS AND THE L.C.C.

To the Editor of THE LANCET.

SIR,—I feel it might be useful to call the attention of teaching hospitals to the policy of the London County Council in making grants to venereal disease clinics as it was laid down at a meeting of the Council this afternoon. It is proposed to concentrate the work of these clinics in six large hospitals, which shall have all-day clinics, and one of these—viz., St. Paul's, Endell-street, is not a hospital connected with any medical school, so far as I know. As a step in this direction, the Council agreed to-day to the discontinuance (from March, 1927) of the grants to the Elizabeth Garrett Anderson and Charing Cross Hospitals, two of the 26 general and special hospitals at present included in the scheme. No one knows which will be the next on the list, nor does the Council or the Ministry of Health give notice to hospitals until it has been decided to discontinue the grant, so that appeal is practically impossible.

During the debate which took place in the Council I pointed out that this policy of six large clinics would entail much travelling by patients, owing to the immense distances to be traversed in London, and that great overcrowding must be expected at clinics which draw patients from a population of over five million persons. In the case of the Elizabeth Garrett Anderson Hospital it seems very inadvisable to discontinue the grant to a hospital which deals especially with venereal disease in married women, more particularly at a time when the Council proposes to spend £317,900 in the coming year on special schools for blind, deaf, defective, and epileptic children, the mothers of whom may have suffered from venereal disease in some form. This hospital is also recognised for the teaching of gynæcology; in the past year it has had 236 new cases of venereal disease, whereas other hospitals which are not being attacked had numbers considerably below this figure. In the case of Charing Cross Hospital it is unfortunate that the clinic belonging to an important teaching school should be attacked, especially in view of the fact that the authorities have recently acquired the premises next door, and would be able to enlarge their special departments in the near future.

Experience gained in maternity and child welfare work and the reduction of deaths from infantile diarrhœa clearly show that most benefit accrues where facilities for knowledge and treatment are easily available, and although it may not be possible to increase the number of venereal disease clinics at the present time, it is surely a retrograde policy to close any of them. The scheme of six large all-day clinics will, I fear, prove both more expensive and less efficient.

I am, Sir, yours faithfully,

STELLA CHURCHILL.

Chiswick, W., March 23rd, 1926.

ADMINISTRATION OF CHLOROFORM WITH OXYGEN.

To the Editor of THE LANCET.

SIR,—It appears to be a usual practice, as described in books of recent date, to attach the tube from the cylinder of oxygen to the afferent metal tube of a Junker or similar apparatus in place of the hand- or foot-bellows, and turn on a stream of oxygen at low pressure to bubble through the chloroform. I have always thought this proceeding open to the objection, which may (with others) be made against all those by which a continuous stream is conducted to the patient's airway, that the intake of the patient in ordinary circumstances is not continuous, and therefore much of the anæsthetic is not only wasted, but blown by his expirations into the faces of those near by. Lately there have been, to my knowledge, two accidents due to some obstruction in the mouth-tube, or kinking of the rubber tube joining this to the bottle. When using a hand- or foot-bellows the anæsthetist is at once aware of such blocking, but with the method under consideration this may not be the case, and the pressure increases until a tube is blown off or the stopper forced out, and chloroform is spurted about. In one instance some drops went down the operator's neck, and in the other into the operator's and anæsthetist's eyes.

I am, Sir, yours faithfully,

London, N.W., March 26th, 1926. J. D. MORTIMER.

GENERAL PRACTITIONERS AND MEDICAL RESEARCH.

To the Editor of THE LANCET.

SIR,—You were good enough to publish a letter from me recently on the question of the endowment of research at the London Hospital. We have since received many letters suggesting subjects for research, and these suggestions will be carefully considered.

One, from an old friend and colleague, Dr. N. M. Goodman, of Lymington, deserves wider publicity. He considers that there is a great opportunity for general practitioners to coöperate with the research departments of their old hospitals, because: (1) They see the beginnings of disease much earlier and more constantly than workers in hospitals. (2) Their observations have the advantage of a continuity which may last from birth to old age. (3) They see many minor, and so-called unimportant diseases "which never come near a hospital." And yet, he points out, little or no research is carried on in private practice because there is no inducement. He states: (1) That a general practitioner does not see enough of any one disease to make his observations worth recording, although the combined experience of a group of practitioners would produce valuable results. (2) That the practitioner lacks direction in his research work—his little bit may be of no value and so he is disheartened from beginning; yet, if he felt that his clinical observations could be linked up with others, and with the pathological and clinical work of his old hospital, he would willingly do it. (3) That any research work done by a general practitioner is a

direct loss to him, either in money or in time. This loss should be made up by a small grant from the mother hospital.

Your readers are more competent to appreciate or to criticise these observations than I am, being a layman. But all of us, medical or lay, who regard our hospitals as the places where disease is to be searched out and fought, must welcome any suggestion which is intended to increase the hospital's power as a fighting force, and is intended to ensure that all hospital men, whether their duties lie within or without the hospital walls, shall always be members of that force. Now, when a man leaves the hospital in which he has worked for years as student and house-man, the sting of the "Good-bye" is that he feels he is dropping out and has no further part in the great adventure.—I am, Sir, yours faithfully,

E. W. MORRIS,
House Governor.

London Hospital, Whitechapel, E., March 26th, 1926.

A COMPENSATION PROBLEM.

To the Editor of THE LANCET.

SIR,—The following sequence of events in a male patient, aged 57, is of some interest.

The patient, X. Y. Z., sustained an accident to his back at the steel works by falling off a large mould on to the edge of a stage. There was much bruising to the muscles of the lumbar region, but no fracture or internal injury could be found. Four weeks later he complained of pain in the left groin and on examination a testicular tumour was found. This was removed 18 months after and found to be a rare tumour of the left testis of early malignancy. Four days after removal of the testis the patient complained of pain in the right iliac fossa and other symptoms of appendicitis. He was removed to hospital and the appendix was found inflamed with an early abscess forming. He made an uneventful recovery.

In view of the possible claim for compensation that may be made in this case I should be glad to hear any views of your readers on the possibility of either the testicular tumour or the inflamed appendix having developed as a sequel of the accident.

I am, Sir, yours faithfully,

March 23rd, 1926. PRACTITIONER.

The Services.

ROYAL ARMY MEDICAL CORPS.

Lt.-Cols. P. H. Falkner and S. M. A. Curran retire on retd. pay.

Maj. and Bt. Lt.-Col. J. A. Anderson retires on retd. pay and is granted the rank of Lt.-Col.

ARMY RESERVE OF OFFICERS.

Lt.-Col. C. Clarke to be Maj. whilst empld. under Art. 505 (*b*), Royal Warrant for Pay and Promotion, 1922, and relinquishes the rank of Lt.-Col.

TERRITORIAL ARMY.

Capt. S. McNaughton resigns his commn. and retains his rank.

Lt. P. Hickey to be Capt.

Capt. H. V. Forster (late R.A.M.C.) to be Lt. and relinquishes the rank of Capt.

ROYAL AIR FORCE.

Flying Officer R. L. C. Fisher is granted a permanent commission in this rank.

M. J. Marren is granted a short service commission as a Flying Officer, for three years on the active list.

ST. MARY'S HOSPITAL POUND DAY.—As a result of the first Pound Day organised for the benefit of this hospital, which was held on March 18th, the sum of £600 was realised in money, and the groceries contributed amounted to more than a ton.

Medical News.

ROYAL COLLEGE OF PHYSICIANS OF LONDON: ELECTION OF PRESIDENT.—An extraordinary Comitia of the College was held on Monday, March 29th, at 5 P.M., the President, Sir Humphry Rolleston, Bart., being in the chair. The President delivered the annual address, much abbreviated in delivery because of the large amount of business before the Comitia. Reference was made to the changes made during the past year in the examination for the membership. Brief obituary appreciations were read of the nine Fellows who had died during the year, including Dr. Howard Tooth, Sir Richard Douglas Powell, Dr. Edward G. Browne, Dr. J. W. Russell, and Dr. G. H. Hunt.

A vote of thanks to the retiring President having been moved and carried, the College proceeded to the election of President. At the first ballot Sir John Rose Bradford received 51 votes, Lord Dawson 37, Sir William Hale-White 19, Dr. Raymond Crawfurd 14, and Dr. John Fawcett 11. The first two of these names were then submitted to a further ballot, when Sir John Rose Bradford received 81 votes and Lord Dawson 65. Sir John Rose Bradford was then inducted to the President's chair.

Dr. R. O. Moon was elected Assistant Registrar, having been nominated by the President at the last meeting of the Comitia, and Dr. J. Walter Carr was elected a representative of the College on the "Professional Classes Aid Council" in place of Dr. Newton Pitt, retired.

In reply to a letter received from the Royal Society, asking the College to appoint a representative to attend a meeting in the Society's rooms on April 30th, for the purpose of organising a celebration of the centenary of the birth of Lord Lister (April 5th, 1927), the President was appointed to represent the College.

Diplomas were granted in tropical medicine to 27 candidates.

Lord Dawson drew attention to the discontinuance of the publication of "Medical Science Abstracts and Reviews." The College affirmed its appreciation of the value of this publication, and hope was expressed that the Medical Research Council would resume it.

UNIVERSITY OF LIVERPOOL.—At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR DEGREES OF M.B. AND CH.B.

Part I.—T. Blezard, H. C. Calvey, F. R. Craddock, L. de Jongh, Lilian W. Edwards, E. E. Glenton, L. S. Goldman, A. W. Green, H. E. Hughes-Davies, Edna Morris, T. C. Newman, Muriel S. Roberts, J. B. Rushton, E. F. Thompson, J. L. Walker, A. J. Walsh, and Joan Watkins.

Part II.—L. de Jongh, T. Lotter, Ivy H. Rowlands, and J. L. A. Webster.

DIPLOMA IN TROPICAL MEDICINE.

W. J. Aitken, A. Ashworth, R. N. Bansikar, N. Bligh-Peacock, Effie G. Bolton, E. H. Boodrie, M. A. B. Brito-Mutunayagam, T. Cullen, H. N. Davies, B. G. V. Dias, E. G. A. Don, H. P. Fowler, Isabella J. Fowler, Katharine M. Hodgkinson, R. Jackson, K. H. Kamakaka, D. Lennox, A. W. Lewis, A. G. Mackay, N. McLean, M. MacSweeney, S. B. Malik, M. E. Merchant, E. F. Molony, S. G. Nashikkar, F. Oppenheimer, F. S. Paterson, L. D. Quigley, M. Rodrigues, A. S. Sachdev, B. Singh, J. Singh, S. A. Talib, C. L. Tan, Catharine F. Taylor, N. S. Turnbull, B. K. Vardya, and T. N. Varma.

DIPLOMA IN TROPICAL HYGIENE.

G. Clark, Ivy Collier, B. L. Davis, A. J. Hawe, D. M. Mackay, and D. A. Skan.

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.

J. H. Barrett, R. Hermon, J. M. Hosey, Irene E. Kenworthy, H. McE. Morris, and D. Ramage.

UNIVERSITY OF EDINBURGH.—At the Graduation Ceremonial recently the following degrees were conferred:—

DOCTOR OF SCIENCE.

Ronald Gray Gordon, M.D.

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY.

Roderick Macdonald.

It is announced that at the bicentenary celebrations of the Faculty of Medicine in June the degree of Doctor of Laws will be conferred on the following: Dr. A. Balfour, Director of the London School of Hygiene and Tropical Medicine; Dr. R. Howden, Professor of Anatomy, University of Durham; Sir George Newman, Chief Medical Officer of the Ministry of Health; Mr. Alexander Primrose, Professor of Clinical Surgery, University of Toronto; Sir John Robertson, Professor of Public Health, University of Birmingham; Dr. Ralph Stockman, Professor of Materia Medica and Therapeutics, University of Glasgow; Mr. A. L. Turner, President of the Royal College of Surgeons, Edinburgh; Sir Norman Walker, formerly Senior Lecturer on Diseases of the Skin, Edinburgh; and Mr. J. T. Wilson, Professor of Anatomy, University of Cambridge.

UNIVERSITY OF DURHAM.—In examinations held recently the following candidates satisfied the examiners :—

Third M.B.—Pathology and Bacteriology, Materia Medica, Pharmacology and Pharmacy, Public Health, and Medical Jurisprudence.—Samuel Carnofsky, Clarence D. C. Golding, Satyen Mozumder, Robert W. Rutherford, and Thomas A. W. Wilson.

UNIVERSITY OF OXFORD.—Robert James Brocklehurst, B.M., University College and St. Bartholomew's Hospital, has been elected to a Radcliffe Travelling Fellowship of £300 for two years. Bernard Thomas Squires, student of medicine, University College, has been elected to a Christopher Welch Research Scholarship of £100 for four years.

ROYAL INSTITUTION.—The after-Easter lectures at the Royal Institution will begin on Tuesday, April 13th, at 5.15 P.M., when Prof. J. Barcroft will deliver a lecture on the Salivary Glands, which will be the first of four lectures by him on Organs of Multiple Function.

LONDON UNIVERSITY : BLOOMSBURY SITE.—In a letter to the Treasury dated March 24th, 1926, the Vice-Chancellor of the University expresses the Senate's hope that the Treasury will still take such steps as are now practicable to secure the retention of as large a part as possible of the Bloomsbury site for University purposes, and announces the appointment of a deputation to confer with the Government on the general situation. This deputation consists of the official members, Sir William Beveridge, Sir William Collins, Prof. Filon, Dr. Graham Little, Sir Josiah Stamp, and Sir Holburt Waring.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.—The twelfth annual conference is to be held at Glasgow from July 1st to 3rd. Discussions will deal with the Provision for the Care of Non-Pulmonary Forms of Tuberculosis (opened by Dr. A. S. M. Macgregor and Mr. James Taylor), and the Actual Place and Function of the Tuberculosis Dispensary in the Tuberculosis Scheme (Sir Robert Philip and Dr. Lissant Cox). There will also be communications dealing with recent advances in tuberculosis by a number of authorities, and institutions in the neighbourhood will be visited. The conference is open to all persons interested in tuberculosis on paying a fee of one guinea. Particulars of reduced railway fares and the like may be had from the secretary at 20, Hanover-square, London, W. 1.

BALNEOLOGICAL CONGRESS AT AIX-LA-CHAPELLE.—The forty-first congress of the German Balneological Society is being held this year at Bad Aachen (Aix-la-Chapelle) from Tuesday, April 6th, to Sunday, April 11th, under the presidency of Prof. Dietrich. Wednesday opens with an introductory address by Prof. H. Strauss, of Berlin, on the Origin and Differential Diagnosis of Chronic Arthritis, and the forenoons of that and the next three days will be occupied by the reading of more than 50 papers dealing with many aspects of gout, rheumatism, and fibrositis, and the effect of various baths on these and other systemic affections. Demonstrations of various kinds will be given in the afternoons by local balneologists and members of the society from Wiesbaden, Nauheim, Pistany, Wildbad, Marienbad, and other continental spas. Saturday afternoon and Sunday will be given up to excursions in the Rhineland. Information may be obtained from Dr. Max Hirsch, Berlin-Charlottenburg, Fraunhofer Strasse 16.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On Thursday, April 15th, at 2 P.M., Mr. W. E. Tanner will give a demonstration in clinical surgery at the Prince of Wales's General Hospital, Tottenham. This demonstration will be free to members and to general course ticket holders of the Fellowship.—From April 19th to May 1st the Bolingbroke Hospital, Wandsworth Common, will hold an intensive course in medicine, surgery, and the specialties.—During May there will be two courses lasting the entire month—on Psychological Medicine at the Maudsley Hospital, Denmark Hill, and on Venereal Diseases at the London Lock Hospital. This latter hospital will hold the clinical course irrespective of numbers, but the lectures will only be given if there is a minimum entry of eight.—From May 3rd to 22nd there will be a clinical and an operative course at the Central London Throat, Nose and Ear Hospital.—The Royal Waterloo Hospital will hold a course in medicine, surgery, and gynæcology from May 3rd to 22nd, with opportunities for attendance in the departments of the hospital.—From May 3rd to 15th the Infants Hospital will hold an afternoon course under the direction of Dr. Eric Pritchard, and a three weeks' course in ophthalmology will be given by the Royal Westminster Ophthalmic Hospital from May 3rd to 22nd.—Copies of all syllabuses, of the general course programme, and of the *Post-Graduate Medical Journal* may be had on application to the Secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

MANCHESTER POOR-LAW PATIENTS. — The Manchester Board of Guardians have approved of a scheme whereby the Poor-law sick patients will receive the same treatment as panel patients. Hitherto Manchester Poor-law doctors have had to provide the medicine for the patients. The new arrangement provides for all prescriptions to be made up by the chemists.

COLLEGE OF NURSING.—From Thursday, April 8th to 15th, there is to be a post-graduate course at the College, arranged by the Public Health Section. Amongst those who will give lectures are Dr. Eric Pritchard, Dr. Letitia Fairfield, Sir Henry Gauvain, Sir John Robertson, Dr. W. F. Whitley, Mr. Sampson Handley, Dr. C. P. Symonds, Dr. James Wheatley, Prof. Louise McIlroy, and Dr. Margaret Rorke. Particulars may be had from Miss Hestor Viney, College of Nursing, Henrietta-street, London, W. 1.

Messrs. J. and A. Churchill expect shortly to publish "The Chemistry of the Proteins," by Dr. Dorothy Jordan Lloyd ; "Recent Advances in Biochemistry," by Dr. John Pryde ; the fourth edition of Sir Maurice Craig's "Psychological Medicine," in which Dr. Thomas Beaton has collaborated ; the second edition of Dr. M. Dobbie's translation of Arvedson's "Medical Gymnastics and Massage in General Practice" ; and a small book called "Ophthalmic Nursing," by Mr. Maurice Whiting.

TRAINING AND APPOINTMENT OF HEALTH VISITORS. Ministry of Health Circular 680 (H.M. Stationery Office, 1*d.*) contains the information that the Minister has approved the Royal Sanitary Institute as the central examining body to conduct examinations for health visitors and to issue health visitors' certificates. On and after April 1st, 1928, the Minister will not approve the appointment of a woman for the first time as a whole-time officer of a local authority with health visiting duties unless she has obtained this certificate, or the diploma issued to students who, before April 1st, 1925, began an approved course of training under the regulations of 1919. The position of existing health visitors is safeguarded, but it is considered desirable that women who have given at least five years' satisfactory service as whole-time health visitors should endeavour to obtain the new certificate. As from Jan. 1st, 1923, the approval given by the Local Government Board under the Health Visitors (London) Order, 1909, to the certificates for health visitors of the Royal Sanitary Institute, the Royal Institute of Public Health, the National Health Society, and the Battersea Polytechnic is withdrawn.

CREMATION SOCIETY OF ENGLAND.—The annual meeting of this society was held at 12, Stratford-place, London, W., on March 24th, when Dr. P. Chalmers Mitchell, Chairman of the Council, presided. On the adoption of the report, the Chairman expressed gratification at the progress made during 1925. The number of cremations in Great Britain had increased, especially in the London area. With the existing cry for building sites, playing fields, and open spaces, he said it was extraordinary that it was not more fully realised how much space was needlessly wasted in cemeteries. Cemeteries were expensive to keep up and invariably showed a loss, whereas crematoria showed a profit, and would show more profit if developed on a larger scale. The number of cremations at the 16 British crematoria during the year was 2701, showing an increase of 306 as compared with the figures of 1924. Of the total for 1925, 1553 cremations were carried out at the four crematoria in Greater London—viz., Golders Green, Ilford, Norwood, and Hendon Park. The Duke of Bedford was re-elected President of the society.

A VISIT TO CZECHO-SLOVAKIA.—As already announced the International Society of Medical Hydrology is this year holding its annual meeting in Czecho-Slovakia from April 15th to 22nd, and has issued an invitation to members of the medical profession to join in the conference and tour which have been arranged. The places to be visited are Karlsbad, Marienbad, Franzensbad, Prague, Pistany, and the spas of the Tatra mountains, and the society and its friends will be the guests of the Czecho-Slovakian Government and of the spa municipalities during their seven days' stay in Czecho-Slovakia. The arrangements include an official reception at Prague on April 19th, and a special conference on rheumatism at Pistany, in which Sir William Willcox (London), Dr. Kahlmeter (Stockholm), Dr. van Breemen (Amsterdam), Prof. A. Strasser (Vienna), Prof. M. Netousek (Bratislava), Dr. Baltaceanu (Budapest), and others will take part. A limited number of applications to join the tour can still be entertained. They must reach the hon. secretary, at 36, Devonshire-place, London, W. 1, at latest by the first post on Monday, April 5th. The total expenses of the visit, including fares to Czecho-Slovakia at special rates, are estimated at about £15. Visitors from England will leave London on Wednesday, April 14th, at 9.15 A.M.

ROYAL SANITARY INSTITUTE.—A sessional meeting will be held in the Town Hall, Weston-super-Mare, on Friday, April 9th, at 11 A.M., when there will be a discussion on the Rôle of Different Agencies in the Improvement of the Milk Supply. Amongst those who will take part will be the hon. local secretary, Dr. W. G. Savage. Those who intend to be there should notify him at the County Health Department, Boulevard, Weston-super-Mare, not later than April 5th.

THE LATE PROF. JONNESCO.—Prof. Thomas Jonnesco, who died on March 28th at Bucharest at the age of 66, was well known in this country and elsewhere for his work on the excision of the cervical sympathetic. He studied in Paris and was at one time prosector in the Faculty of Medicine, returning later to Bucharest as professor. He was a brother of the late Mr. Take Jonnesco.

OPTICAL DISPENSING.—A deputation from the Joint Council of Qualified Opticians and the British Optical Association was received by the Minister of Health on March 26th and discussed with him the Bill to secure the registration of optical practitioners and to regulate the practice of Sight Testing and Optical Dispensing, which has been presented to Parliament by a private Member. Mr. Neville Chamberlain admitted that the opticians had a case up to a certain point. He had some sympathy with their claim that persons who had properly qualified themselves to treat errors of refraction not requiring medical attention should have a special label, and he would like to meet this point. The difficulty out of which he could not see his way was how patients suffering from simple errors of refraction could be distinguished from those in whom defect of vision was due to some pathological condition.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

BIRTHS AND DEATHS REGISTRATION BILL.

THE Bill introduced by Mr. TINNE to amend the law relating to the registration of births and deaths was considered on Tuesday, March 23rd, by a Standing Committee of the House of Commons. The object of this Bill is to render more complete the legal safeguards in relation to the disposal of the dead, so as to prevent any possibility of the concealment of crime. Local authorities are empowered by the measure to arrange for the medical inspection in certain instances of the bodies of deceased persons, and stillbirths are required to be registered as an additional safeguard for the protection of infant life. Clause 1, which prohibits the disposal of a body except on a registrar's certificate or a coroner's order, was agreed to with slight amendments, as were also a number of other clauses containing provisions of a consequential character. Major-General Sir RICHARD LUCE moved an amendment providing that if the cause of death was unknown to the medical practitioner called upon to certify, or if he was of opinion that death had arisen from, or been accelerated by any violence, neglect, poison, or other unnatural cause, or had followed as an immediate sequence to the administration of an anæsthetic, he should not grant any certificate of death, but should forthwith report the circumstances to the coroner. He said that the object of the amendment was to lay down some definite procedure to guide medical practitioners who might be in doubt. Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) said that there was no necessity for the amendment because it was already the duty of medical men and others under the Common Law in cases of this kind to give immediate notice to the coroner. Sir RICHARD LUCE withdrew his amendment.

The same Bill was further considered in Standing Committee on Thursday, March 25th. Mr. GROVES opposed Clause 7, which empowers certain local authorities in cases where a body has not been seen by a registered practitioner since the death to provide for its medical inspection on the request of the coroner for the district. He said there was a fear among a large section of the population that insufficient attention was paid by the medical profession to the possibility of premature burial. Sir KINGSLEY WOOD supported the clause. Referring to a proposed new clause standing in the name of Mr. GROVES which provided that a death should not be registered unless and until there had been delivered to the registrar for the district a medical certificate of the fact and cause of death, he said this was a proposal which had wrecked every previous Bill of this kind. In the view of the Government there was not a sufficient body of evidence to warrant such a drastic provision. On a division the clause was struck out of the Bill by 19 votes to 7. Mr. GROVES did not move his proposed new clause. The Committee stage was concluded and the Bill was ordered to be reported with amendments to the House.

HOUSE OF LORDS.

THURSDAY, MARCH 25TH.

LEGITIMACY BILL.

The LORD CHANCELLOR moved the second reading of the Legitimacy Bill which he said was in substance similar to the Bills of 1924 and 1925. The main purpose was contained in the first clause which provided that where the parents of an illegitimate person married, or had married one another, the marriage should render that person legitimate from the commencement of the Act if the marriage had already taken place, or from the date of the marriage, whichever last happened. The schedule of the Bill provided that the Registrar-General should not re-register the birth of a legitimated person in any case where information with a view to obtaining such re-registration was not furnished to him by both parents, with three exceptions. The first was that the person acknowledging himself to be the father of the legitimated person had been entered in the register in pursuance of Section 7 of the Births and Deaths Registration Act, 1874; the second, that the paternity of the legitimated person had been established by an affiliation order, or otherwise, by a court of competent jurisdiction; and third, that a declaration of legitimacy had been made under the Legitimacy Declaration Act, 1858.

Viscount HALDANE said that on the whole the Bill was a fair compromise on a matter in regard to which there had been a great divergence of opinion.

The Bill was read a second time.

CORONERS BILL.

The Coroners (Amendment) Bill was considered on report.

The LORD CHANCELLOR moved a new clause providing that the Coroners Act, 1892 (which relates to the appointment and powers of deputy coroners) should apply with the necessary modifications to the coroner for the King's household as it applied to county and borough coroners, and in particular with the modification that the appointment of a deputy to the coroner for the King's household should be subject to the approval of the Lord Steward. He explained that it was necessary to make provision for the appointment of a deputy coroner of the King's household in case the principal coroner should be unable to perform his duties.

The new clause was agreed to.

On Clause 21, which deals with the power of a coroner to request specially qualified persons to make post-mortem and special examinations, Subsections (2) and (3) as printed in the Bill were omitted on the motion of the Lord Chancellor, and the following new subsections were inserted in their place:—

(2) If any person who has made such a post-mortem or special examination as aforesaid is summoned by the coroner as a witness he may be asked to give evidence as to his opinion upon any matter arising out of the examination, and as to how in his opinion the deceased came by his death.

(3) The provisions of this Act prescribing the fees payable to medical witnesses shall not apply with respect to any examination made at the request of the coroner under this section, but the fees payable in respect of any such examination shall be such as may be prescribed by the schedule of fees, allowances, and disbursements made by a local authority under Section 25 of the Coroners Act, 1887, or by rules made by the Secretary of State under this Act.

The LORD CHANCELLOR moved the following new clause dealing with fees to medical witnesses:—

The fees payable to a legally qualified medical practitioner who has made any post-mortem examination by the direction or at the request of a coroner, or who has attended an inquest in obedience to a summons of a coroner under the Coroners Act, 1887, shall (save as in this Act otherwise expressly provided) be as follows, that is to say: (*a*) For attending to give evidence at any inquest whereat no post-mortem examination has been made by the practitioner, one guinea; and (*b*) for making a post-mortem examination of the body of the deceased and reporting the result thereof to the coroner without attending to give evidence at an inquest, one and a half guineas; and (*c*) for making a post-mortem examination of the body of the deceased (including the making of a report, if any, of the result thereof to the coroner) and for attending to give evidence at an inquest on the body, two guineas:

Provided that no fee or remuneration shall be paid to a medical practitioner for the purpose of a post-mortem examination instituted without the previous direction or request of the coroner.

The new clause was agreed to.

On the motion of the LORD CHANCELLOR the following new clause was agreed to applying the Coroners Acts to the City of London:—

From and after the occurrence of the next vacancy in the office of coroner for the City of London the provisions of this Act and of any other enactment relating to the office of borough coroner or to borough coroners shall apply with respect to the City of London as if the Common Council were the local authority and as if the coroner for the City of London were a borough coroner, and any expenses of the Common Council under the said enactments shall be defrayed out of the general rate.

The report stage of the Bill was concluded.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 24TH.

The Geneva Opium Convention.

Viscount SANDON asked the Secretary of State for Foreign Affairs whether the Opium Convention had been ratified by the Government; if not, why it had been delayed and when it would be ratified; what Governments had deposited ratifications at the League of Nations; whether the Convention had yet taken effect; and whether the Central Board had been set up.—Sir A. CHAMBERLAIN replied: The British ratifications of the Opium Agreement and Dangerous Drugs Convention, signed at Geneva on Feb. 11th and 19th, 1925, respectively, were deposited with the League of Nations on Feb. 17th. So far as H.M. Government are aware, no foreign Power has yet ratified the Agreement or Convention. Under Article 36 of the Convention, the Convention will not come into force until it has been ratified by ten Powers, and under Article 19 the Central Board will be appointed within three months from the coming into force of the Convention. Under Article 14 of the Opium Agreement, the Agreement will come into force on the ninetieth day after the receipt by the Secretariat-General of the League of Nations of ratifications by two Powers.

THURSDAY, MARCH 25TH.

Physical and Medical Standards in the Navy.

Mr. HORE-BELISHA asked the First Lord of the Admiralty why the physical and medical standard of the non-continuous service recruits was being lowered, seeing that present serving ratings who had previously passed the highest physical and medical tests were now being invalided in large numbers, the cause in the majority of cases not being attributable to naval service.—Mr. DAVIDSON (Parliamentary Secretary to the Admiralty) replied: Assuming that the question refers to the physical and medical standards for special service seamen, it is not considered necessary to insist on quite the same high physical and medical standards for special service seamen as for long service ratings. The proportion of naval ratings who are invalided annually is quite small.

Resignation of Medical Staff at Paris Hospital.

Major-General Sir RICHARD LUCE asked the Secretary of State for Foreign Affairs whether his attention had been called to the position created at the Hertford British Hospital, Paris, by the resignation of the medical staff; and, if so, what action he proposed to take in the matter.—Mr. A. M. SAMUEL (Parliamentary Secretary to the Department of Overseas Trade) replied: I am aware that the medical staff of the Hertford British Hospital, Paris, resigned in November, 1924. The staff has been replaced, and no action on the part of H.M. Government appears to be necessary.

Accident to Boys at Coal-mines.

Mr. HAYDAY asked the Secretary for Mines the number of accidents, fatal and non-fatal, respectively, received by boys of 16 years of age and under employed in or about the coal-mines for the year ending 1925.—Colonel LANE FOX replied: Seventy-nine boys of 16 years of age and under employed in and about mines under the Coal Mines Act were killed during the year 1925, and 15,241 were disabled for more than three days. The number of boys employed in 1924, the latest year for which figures are available, was 64,799.

Artificial Sunlight Treatment.

Sir HARRY BRITTAIN asked the Minister of Health to what extent the artificial sunlight treatment had been introduced into the hospitals in this country; and whether this form of treatment was proving successful.—Mr. N. CHAMBERLAIN replied: I have no complete information as to the number of hospitals in this country in which this form of treatment is provided, but arrangements for the provision of this treatment have been approved, in connexion with tuberculosis and maternity and child welfare schemes, in the case of 26 hospitals and sanatoria (exclusive of tuberculosis dispensaries and maternity and child welfare clinics). Reports on the approved schemes are now being considered in my department, and I am not yet in a position to give a complete reply to the second part of the question, but I may say that this form of treatment, if appropriately applied, is undoubtedly beneficial in many cases.

Approved Societies and Dental Treatment.

Mr. ROBINSON asked the Minister of Health what approved societies made provision for dental treatment; and if he would take steps to ensure that dental treatment and the provision of dentures should be included in the treatment provided under the National Health Insurance Acts.—Mr. NEVILLE CHAMBERLAIN replied: Some 3500 approved societies and branches in England, having a total membership of over 10,500,000 insured persons, have adopted schemes of additional benefits that include payments towards the cost of dental treatment. These numbers are likely to be materially increased from next July, when schemes following the second valuation will become operative for societies and branches valued as at the end of 1923. The Royal Commission on National Health Insurance, who considered the subject exhaustively, came to the conclusion that while a complete dental service for the whole insured population would be eminently desirable, it is not at present financially practicable, and they recommended that the general arrangements for dental service under additional benefit schemes should be continued. Societies and branches having a sufficient disposable surplus on valuation are reminded of the possibility of their adopting dental benefit as an additional benefit, and I propose that this shall remain the practice.

Encephalitis Lethargica.

Mr. BRIANT asked the Minister of Health the number of cases of encephalitis lethargica notified during each of the years 1922, 1923, 1924, and 1925.—Mr. N. CHAMBERLAIN replied: The information asked for is as follows: Number of cases notified in England and Wales (including port sanitary districts): 1922, 454; 1923, 1025; 1924, 5039; 1925, 2635 (provisional).

Reductions in Pensions Staff.

Lieut.-Colonel DALRYMPLE WHITE asked the Minister of Pensions what reduction of staff was effected in the Ministry of Pensions during the year 1925; and what were the respective percentages of reduction in Scotland and in the rest of the country.—Major G. C. TRYON replied: The staff of the Ministry were reduced, during 1925, by 4356, from 16,475 to 12,119, the percentage reduction in Scotland being 23·5 and in the rest of the country 26·7.

FRIDAY, MARCH 26TH.

FACTORY LAW REFORM.

Miss WILKINSON moved the second reading of the Factories Bill, a measure introduced by the Labour Party to consolidate with amendments the various enactments relating to factories and containing 143 clauses dealing with health, safety, and welfare conditions, accidents and industrial diseases, and the employment of women, young persons, and children. She said that during the last 25 years there had been an extraordinary increase in accidents in factories and workshops. The number in 1924 was 159,723, involving actual absence from work, or an increase compared with 1923 of 44,000. There were in 1924 956 fatal accidents, an increase of 89 over 1923. The Chief Inspector of Factories had pointed out that all accidents were not recorded. The Industrial Fatigue Board, in their report for 1925, said the loss of time due to sickness, most of it preventable, cost the country ten times more than strikes and labour disputes. To prevent this waste of human assets and human capital was the object of the Bill. This was a private Member's Bill only in a technical sense. It was drawn up by the Home Office originally. She believed its godfather was Mr. Bridgeman, the present First Lord of the Admiralty, but his work had been extended and considerably improved by Mr. Arthur Henderson when he, too, was Home Secretary. The Bill was, in fact, founded upon numerous inquiries, conferences, and special reports. It contained a very elaborate health code, dealing with cleanliness, overcrowding—increasing the space for each worker from 250 to 400 cubic feet—temperature, ventilation, lighting, sanitary conveniences, and also general provisions for safety. The employment of children was prohibited. For women and young persons the total hours to be worked, exclusive of intervals for meals and rest, were not to exceed nine in any day or 48 in any week, and certificates of fitness of young persons for employment would have to be provided. The new clauses and the altered clauses provided health and safety codes and a general improvement in factory law. There was not one thing in the Bill which good employers were not doing already.

Mr. STAMFORD seconded the motion for the second reading.

Captain MACMILLAN moved the following amendment:

"That this House, while recognising the necessity for the introduction during this session of a Bill to consolidate and amend the laws relating to factories for the purpose of circulation and discussion in consultation with the interests affected, is of opinion that a measure of such far-reaching importance should not be introduced as a private Member's Bill."

He said that the procedure contemplated in his amendment was that the Government should introduce a Bill dealing with this subject this session for the purposes of circulation and discussion by all the interests affected. As a result of this method he hoped that by the time the Bill put forward by the Home Secretary went to Committee it might be to all intents and purposes an agreed measure. They looked to the Government to produce a fair-minded Bill which would not be calculated to throw undue or

unreasonable demands on industry and which would confer continuous and progressive benefits on those engaged in industry.

Sir LESLIE SCOTT seconded the amendment.

Sir W. JOYNSON-HICKS (Home Secretary) said while he was keen on all questions of social reform, and the Factories Bill was one of the first measures which he took in hand at the Home Office, nothing was to be gained by exaggerating the evils of the present system. It was untrue to say that if the Bill were not passed this year thousands of lives would be lost by accidents in the factories. There had been a slight increase in the number of fatal accidents recorded during the past year, but the numbers had persistently risen and fallen in proportion to the number of men and women employed in trade. In 1913 the number was 1309, and in 1919, when more people were employed, it was 1385; and in 1920, when trade was at its highest point, 1404. While he had been considering the Factories Bill improvements in nine or ten considerable industries had been made by regulations issued by the Home Office and arrived at with the concurrence of the employers and workers concerned. The Bill now presented for second reading conferred great powers and responsibilities on the Home Secretary, and in drafting his own Bill he had been doing his utmost to relieve the Home Office of such powers. As nineteen-twentieths of Mr. Bridgeman's Bill was contained in the Labour Government's Bill, so nineteen-twentieths of both these Bills would be contained in the forthcoming Factories Bill. He did not, however, propose to include the provisions affecting night baking. His Bill would abolish the distinction between textile and non-textile factories, and between factories and workshops. He had included new provisions affecting cleanliness, overcrowding, temperature in factories, and sanitary conveniences. There would be special medical provision and supervision in classes or descriptions of factories where there was exceptional liability to sickness or disease; and welfare provision with regard to drinking water, first-aid outfits for workers, protective clothing, and so forth. Many special health provisions included protection against dust, against the lifting of weights, and also dealt with underground work. There was a good deal to be said in regard to the terrible hours worked by women in a few industries. He hoped to deal with that apart from the Washington Convention. He was authorised by the Prime Minister and the Cabinet to say that he would introduce a Factories Bill during the current session for the purpose of consideration and discussion at the earliest possible moment in the session of 1927. That Bill would be one of the principal Government measures of next year and they would do their utmost to pass it into law.

After further discussion the amendment was carried by 184 votes to 109—majority 75.

Appointments.

EVANS, W., M.B., B.S. Lond., has been appointed Assistant Pathologist to the London Hospital.

GILCHRIST, SUSAN, M.B., Ch.B. Liverp., Assistant Medical Officer of Health, Hull.

HOLMES, A. HILLYARD, M.D. Manch., M.R.C.P. Lond., Visiting Physician to Withington Institution and Hospitals, Manchester.

HUTCHINSON, R. J., M.R.C.S., L.R.C.P. Lond., Certifying Surgeon under the Factory and Workshop Acts for the Haslemere District of the County of Surrey.

Vacancies.

For further information refer to the advertisemnt columns.

Alton, Hants, Lord Mayor Treloar Cripples' Hospital and College.—Second Asst. Res. M.O. £300.

Belfast, Mater Infirmorum Hospital—Hon. Asst. Gynæcologist.

Birmingham, Public Health Dept., Tuberc. Sect.—Asst. M.O. £450.

Brighton, Sussex Throat and Ear Hospital.—Hon. Asst. S., Hon. Clin. Asst., and Hon. Asst. Anæsthetist.

Cambridge, Addenbrooke's Hospital.—Cas. O., and Res. Anæsthetist. At rate of £130.

Carmarthen, Joint Counties Mental Hospital.—Jun. Asst. M.O. £300.

Derbyshire Royal Infirmary, Derby.—H.S. £200. Also Asst. H.S. and Cas. O. Each at rate of £150.

Exminster, Devon Mental Hospital.—Jun. M.O. £300.

Gloucester County Mental Hospitals, Wotton and Barnwood.—Jun. Asst. M.O. £350.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. and H.P. At rate of £150 and £100 respectively.

Lambeth Parish Hospital, Brook-street, Kennington, S.E.—Jun. Asst. M.O. £200.

London Temperance Hospital, Hampstead-road, N.W.—Surg. Reg. 40 guineas.

Macedonia Friends Council for International Service.—Med. Man required. £14 monthly.

Manchester, Ancoats Hospital.—Res. Surg. O. £200

Manchester Royal Infirmary.—H.S. to Aural, Gynæcological, and Ophth. Depts. At rate of £50. Dickinson Pathology Scholarship. £75. Dickinson Research Travelling Scholarship. £300

Metropolitan Hospital, Kingsland-road, E.—Sen. H.P. and H.S., Jun. H.P. and H.S., and two Cas. O.'s. Each at rate of £100.

Parish of St. John, Hampstead, New End Hospital.—Sen. Res. Asst. M.O. £250.

Prince of Wales's General Hospital, Tottenham, N.—Two H.S.'s. and one H.P. At rate of £120. Also Jun. H.S. and Jun. H.P. At rate of £90.

Royal Chest Hospital, City-road, E.C.—Res. M.O. and H.P. At rate of £150 and £100 respectively.

Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Hon. Ophth. S. and Hon. Dental S.

Royal Northern Hospital, Holloway, N.—H.P. and H.S. Each at rate of £70.

St. Bartholomew's Hospital, E.C.—Rose Research Fellowship in Lymphadenoma. £600.

St. Mary's Hospital for Women and Children, Plaistow, E.—Asst. Res. M.O. At rate of £130.

Sunderland Borough Mental Hospital, Ryhope.—Asst. Med. Supt. £500.

Truro, Royal Cornwall Infirmary.—H.S. £170.

Walthamstow, Wanstead and Leyton Hospital, Orford-road, E.—Jun. H.S.

West Ham County Borough.—Asst. M.O. £600.

West London Hospital, Hammersmith-road, W.—Hon. Med. Radiologist.

West Middlesex Hospital, Isleworth.—Asst. Med. Supt. £250.

Westminster Hospital, Broad Sanctuary, Westminster, S.W.—Asst. Dent. S.

York City Mental Hospital, Fulford, York.—Asst. M.O. £440.

The Secretary of State for the Home Department gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act, 1906, for the Districts of the Uxbridge and Brentford County Courts (Circuits 34 and 46 respectively). Applications should reach the Private Secretary, Home Office, not later than April 21st.

Births, Marriages, and Deaths.

BIRTHS.

GRANTHAM-HILL.—On March 19th, at Port Sudan, the wife of C. Grantham-Hill, M.B., of a son.

HICKINBOTHAM.—On March 25th, at Colchester, the wife of J. R. Hickinbotham, M.B., of a daughter.

MARTIN.—On March 20th, at New Brook House, Atherton, Lancs, the wife of Major W. Y. Martin, T.D., R.A.M.C.T. of a daughter.

MARRIAGES.

PARKES—MACKINTOSH.—On March 27th, at Withington Congregational Church, Manchester, Miles Parkes, M.B., Ch.B., to Annie Emily Mackintosh, M.B., Ch.B.

DEATHS.

FINLAYSON.—On March 19th, very suddenly at his residence, Elson-road, Formby, Lancs, Harold Turner Finlayson, M.B., Ch.B., aged 36.

YOURDI.—On March 23rd, at Jersey Dispensary, Lieut.-Colonel John Robert Yourdi, O.B.E., R.A.M.C. (Retired List), of Roslyn, La Rocque, Jersey.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

CHILD WELFARE IN LIVERPOOL.—At the twentieth annual meeting of the Child Welfare Association, held in Liverpool on March 22nd, it was stated that at one time the Association had a warehouse where 250 spinal carriages were stored; now two dozen are sufficient for its needs. Throughout the length and breadth of Liverpool, said the chairman, it would be difficult to find a child growing up into a permanent cripple for lack of efficient treatment. During the year 4885 new applications for help were received, 32,000 parents advised and helped, 1770 children maintained in convalescent homes, 20,000 visits paid to the homes of the children, and 40,000 orders issued for milk for children. Last year a new wing was added to the hospital at Leasowe, and this with other developments cost £24,500.

TESTIMONIAL TO DR. HERBERT JONES.—The Herefordshire Medical Society is organising a testimonial to Dr. Herbert Jones, medical officer of health for the Herefordshire combined districts, who has been obliged to resign his appointment on account of ill-health, largely due to services in the war. Dr. Jones has a distinguished record of service. In the words of the executive secretary of the Society of Medical Officers of Health, "he has been the chief mover in the matter of security of tenure and superannuation for medical men holding public appointments. In other matters also he has worked as hard for the British Medical Association as for this society, and he has been so busy looking after the interests of other people that in the opinion of many of his friends he has not been ready enough to fight for his own." Dr. Jones's work has been of service to the profession as a whole, and the Herefordshire Medical Society is accordingly making an appeal beyond the limits of the county. Subscriptions should be sent to Dr. John Steed, Staunton-on-Wye, Hereford, before April 30th.

Notes, Comments, and Abstracts.

HELIOTHERAPY, PHOTOTHERAPY, AND THE OPEN AIR.

AT a meeting of the Harveian Society on March 18th Dr. Gordon Pugh, chief medical officer of the Children's and Surgical Tuberculosis Services of the Metropolitan Asylums Board, made some interesting observations on prevailing ideas of light treatment. Heliotherapy and phototherapy, he said, were being widely described in the press as more or less recent discoveries of very great value. In particular stress was being laid on an increase in the bactericidal power of the blood, which was supposed to have important effects in the prevention and cure of disease. Dr. Leonard Hill, however, had said at Bath last September that a similar rise was produced by heat or a mustard poultice whenever these produced a lasting erythema. Some of the claims made appeared rather extravagant, and it had to be considered whether any really new therapeutic principle was being introduced, or whether in heliotherapy, and to a more limited extent in phototherapy, the old-established healing agents—fresh air and surface hyperæmia—were appearing in another, perhaps more convenient, form.

After recalling the totally inadequate provision for London's cases of surgical tuberculosis before the hospitals at Alton and Carshalton were opened in 1908 and 1909 respectively, Dr. Pugh related his impressions of the three methods of treatment as experienced at Carshalton—namely: (1) open-air therapy, which was British in origin, the first hospital for the complete open-air treatment of surgical tuberculosis being the Baschurch Hospital, founded by Miss Hunt in 1902; (2) heliotherapy, which might be called the Swiss method, since it owed its popularity to the efforts of Dr. Rollier, who began to use general sunlight baths in 1903; and (3) phototherapy, which might be regarded as Danish, as it was started in 1894 by Dr. Finsen, who died ten years later. Phototherapy had been made more generally available by Kromayer in 1904, when he introduced the mercury-vapour quartz lamp; and had been modified still further in 1913 by Reyn, who added to local treatment general irradiation by the carbon-arc lamp on the ground that its rays more nearly resembled those of the sunlight used by Rollier.

Heliotherapy and the Open Air.

Speaking first of constitutional treatment by the open-air method, Dr. Pugh showed photographs of the satisfactory results obtained by this means at Carshalton in surgical tuberculosis, marasmus, and rickets, before the gradual adoption of heliotherapy from 1914 onwards. Each of the component parts of open-air life, he said, was of importance—the exposure of limited portions of the body to movements of air, changes of temperature, and sunshine or skyshine; the effect of breathing cool air with low vapour tension in promoting evaporation from the respiratory membrane, and so enhancing the outflow of secretion from it and the flow of lymph and arterial blood through it, and possibly other attributes yet unrecognised. In addition, there was the potent influence, whatever it might be, embraced in the term "change of air and environment."

Heliotherapy might be regarded as an improved form of open-air therapy, the presence of sunlight encouraging and rendering the open-air life more easy and pleasant. The main evidence for Rollier's belief that the sunlight was the important factor rather than the open air, was that the deeper the pigmentation became the better the prognosis. Rollier appeared to regard pigment as a transformer of light energy into energy which was spent in some chemical reaction useful in defence. It could not be denied, said Dr. Pugh, that a close parallelism between pigmentation and favourable prognosis—if such parallelism really existed—would be very strong evidence that the sunlight was the potent agent; but Dr. Pugh's observations at Carshalton did not confirm it. In 1922 a careful note was made of the pigmentation of 232 cases of tuberculosis of spine, hip, and knee, many of them severe cases admitted with sinuses. Three and a half years afterwards, when all except 21 nearly convalescent cases were either cured or dead, they were classified according to result. The mortality among the "very good" pigmenters had been 16 per cent., the "good" pigmenters 15 per cent., the "slight" pigmenters 10 per cent., and the non-pigmenters 9 per cent. He regarded this as disproving Rollier's theory. Dr. Hill, he thought, had reached the solution when, in 1922, after an investigation in collaboration with Dr. Argyll Campbell, he attributed the benefit of heliotherapy as conducted at Alton mainly to the great rise in metabolism which occurred as a result of the cooling power of the open air, and added that the rise due to sunlight per se was insignificant, but that sunshine promoted evaporation from, and flow of lymph through, ulcers and discharging sinuses, and also warmed the diseased parts exposed to it.

It was true that Dr. Hill had modified his views since then, but so far Dr. Pugh had not seen clinical reason to do so. It seemed possible, he said, to explain all the benefits of heliotherapy as being produced partly by suggestion, partly by the increased metabolism induced by the very free exposure to the air which heliotherapy involved, partly by surface hyperæmia and the resulting lymphorrhœa, and partly, as in rickets, by the formation of vitamin D through the action of the sun's rays on cholesterol.

Phototherapy.

Dr. Pugh then discussed the influence of artificial light in treatment, and the importance of separating subjective from objective manifestations. The subjective effects, in his experience, were more marked than the objective. Suggestion played some part, no doubt; but this was not all. Dr. Hill had said that there was no increase in metabolism. Could the stimulation of nerve-endings by the rays act reflexly on internal processes, and so produce the feeling of well-being which made this treatment so much appreciated by the over-worked, the neurotic, and the run-down? On the more serious forms of neurasthenia it had no permanent effect so far as his own limited experience went; he had treated two cases only, one resulting from war shock, the other from accident. On the objective side three effects had to be considered: (1) hyperæmia of the surface, which conceivably might lead to reduction of high blood pressure by vaso-dilatation, lymphorrhœa (which would assist in the healing of ulcers and superficial sinuses), and improvement in abnormal skin conditions—e.g., eczema, psoriasis, alopecia areata, and lupus; (2) production of vitamin D by the action of rays on cholesterol; and (3) the short-lived increase in hæmo-bactericidal power.

Dr. Pugh demonstrated a large number of photographs of patients before and after exposure to from 30 to 80 carbon-arc baths. In a glandular abscess of the neck, with reddened undermined skin over it and a small discharging sinus, the undermining had continued to extend. In similar cases in which the undermined skin was cut away and the lesion scraped, and other superficial sinuses and ulcers connected with tuberculous phalanges and tarsal bones, healing was definitely hastened by the light bath, especially when there had been previous scraping. It was interesting to note that the Finsen Institute had two operating theatres for 149 beds. Sinuses connected with deeper structures—e.g., spine and hip-joint, in which help was especially desirable—showed absolutely no improvement; an old empyema sinus similarly remained unchanged. In some cases the Murray Levick red-ray lamp was used on superficial ulcers, and appeared as efficacious, if not more so. A severe case of acute general eczema, after two months' ineffective treatment by ointment, was given carbon-arc irradiation; 29 baths in three months got it well under control, and a month later it was quite cured. Two other cases of eczema still under treatment showed little or no improvement. A case of psoriasis had not improved after 40 carbon-arc baths; one of the larger patches was then blistered by the Kromayer lamp, and it had completely disappeared when the scab separated. One child with a localised patch of lupus on the cheek showed, beyond a disappearance of the scaliness, no definite improvement at the end of two months in spite of 17 general light baths; the patch was then blistered with the Kromayer lamp three times at intervals of about three weeks, the arc bath being continued; after six weeks' rest from treatment there was marked improvement, only a few active nodules remaining. Several other cases of more extensive lupus affecting the nose and limbs, which had been given many carbon-arc baths, showed no benefit beyond a cleaning up of the surface.

Dr. Pugh drew attention to statements by several dermatologists about the limitations of usefulness of the Finsen lamp in the treatment of lupus, and to the suggestion of Mr. Sampson Handley that, in any method of treatment, radium γ rays should be used around the circumference of the area to excite an aseptic lymphangitis and obliterate the lymphatic vessels around the infected area, so as to provide an insuperable barrier to spread. This suggestion, he thought, might be of value, as he had used radium γ rays in the treatment of tuberculous adenitis during the past three years with very satisfactory results. As regards rickets, he thought it would generally be impracticable to withdraw a mother from household duties at the busiest time of the day to take her child regularly to a light treatment clinic; and it was probably unnecessary, as the administration of a sufficient quantity of cod-liver oil at home answered the purpose in the majority of cases, particularly if it was adopted as a preventive measure during the autumn and winter months.

High Blood Pressure: Infectious Diseases.

Dr. Pugh's experience of the use of general arc baths in the treatment of high blood pressure was, he said, naturally very small. In one case, however, the pressure, which had

been reduced from 180 to 140 mm. by six weeks' rest, fell to 136 mm. after a course of carbon-arc baths; at the end of a second course, given after a long interval, the pressure was 150 mm. In another case treatment was commenced only a fortnight before; the pressure fell 4 mm. from 195 mm. after the first light bath, and then 10 mm. as the result of epistaxis; at the end of the fortnight, during which time the patient had had six light baths and several attacks of epistaxis, the pressure was 150 mm. Both patients declared that they felt better for the treatment and had lost their headaches. It had been said that light treatment increased the hæmo-bactericidal power, and that this might put up the general resistance of the body to disease.

So far as infectious diseases were concerned this had not been confirmed at Carshalton. Epidemic catarrh and chicken-pox, when introduced into wards, had affected patients indiscriminately, whether they were receiving light treatment or not. This was compared with the influence of open-air treatment in the limitation of spread of infection. Measles had been recently introduced into one ward of a block containing young recumbent patients, 30 of whom were being treated indoors in two wards and 30 in verandahs. The disease spread into the other ward, and of the 22 indoor children who had not previously had measles, 21 caught it; none of the 13 verandah patients who had not had measles developed it, although they were looked after by the same nurses as the indoor children. Vaccination had not been influenced by courses of light treatment, whether these were given before or after, or both. He had been informed by Dr. T. H. Woodfield, of the Park Fever Hospital, that his impression, after using ultra-violet light in the treatment of 20 cases of whooping-cough, was that good was done in the early stages, but that when well-established the disease was not influenced by light treatment; his results had been inconclusive for diphtheria carriers.

Dr. Pugh trusted that the introduction of phototherapy into town hospitals would not lead to delay, however short, in the transfer of cases of surgical tuberculosis to country institutions, as it was obvious that it had very serious limitations as compared with open-air or sunlight therapy.

PUBLIC HEALTH IN PERSIA.

1914–24.

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(*Concluded from p. 694.*)

PART III.

Medical Practice.

As is only natural in a country which produced Avicenna and Rhazes, the practice of medicine is a popular profession. Tehran, for instance, has a doctor for every thousand inhabitants. There are, on the other hand, country districts, hundreds of square miles in extent, where there are no doctors at all. Before the passing in 1911 of a law obliging all students to take the State diploma through the Government Medical School, permits to practise could be obtained by apprentices of native doctors and assistants trained in the various foreign hospitals. The "authorised" doctors (médecins autorisés) still form the bulk of the profession. A second class are Persians qualified in their own or foreign medical schools (médecins diplomés). Most of those who have gone abroad have studied in France; a much smaller number have qualified at Beyrout, in England, America, or Germany. Foreigners are expected to register their diplomas at the Ministry of Public Instruction. They include medical officers of Legations and Consulates, doctors in Persian employ, missionary doctors, medical officers of commercial undertakings such as the Anglo-Persian Oil Company, and private practitioners. This last class practically did not exist before the Russian revolution; there is now in the north of Persia a considerable number of Russians and Armenians with European qualifications.

Persian practice is largely medical. There are few surgeons, though in many towns there are men who extract cataract and cut for stone. While old remedies are in constant use and the distinction between "hot" and "cold" much insisted on by the older practitioners and by patients, foreign drugs such as antipyrin, phenacetin, aspirin, calomel, boric acid, zinc sulphate, sublimate, salines, and, of course, quinine, are much employed and their names and uses well known by the laity. A striking feature of Persian practice is the avidity with which the latest pharmaceutical products of enterprising firms in Europe are used. The country is flooded with samples and circulars. The names of certain reputable firms, however, are well known and their preparations highly esteemed. It is only within the last three years that X ray examinations and treatment have been possible in the capital, and there are now two outfits. These, and the opening of a public pathological laboratory in 1921, have done much to improve methods of practice.

There is no dental school and there are very few foreign dentists. Again the capital is more fortunate in this respect than the rest of the country. Locally trained dentists are now required to pass a simple examination.

A Medical Debating Society was formed in Tehran in 1924 with Dr. J. Scott, medical superintendent of the Indo-European Telegraphs, as President. It holds fortnightly meetings during the spring, autumn, and winter, and has formed the nucleus of a pathological museum.

Chemists' shops are numerous, but highly qualified chemists few. During recent years regulations have been drawn up, so that at present the better class will not supply poisons or narcotics without a doctor's order, and a record has to be kept of sales. In 1919 a law was passed regulating the practice of pharmacy and obliging chemists to take out permits from the Ministry of Public Instruction. They were given to three categories: (1) those who had European diplomas; (2) those who had worked continuously in a reputable pharmacy during the previous five years; (3) those who could pass a simple examination locally. In 1922 a school of pharmacy was opened in connexion with the medical school, and all would-be chemists must pass through it. Unfortunately the school is poorly equipped.

Irregular Practitioners.

The number of irregular practitioners is legion. Every woman is an authority on medicine and uses remedies such as castor oil, cassia, manna, infusions of violets and decoctions of various herbs, and opium. Some women specialised in the treatment of syphilis by calomel fumigations, but since the introduction of salvarsan less has been seen of their results. There are bonesetters, generally butchers, who adjust displaced bones and produce disastrous effects in the case of fractures. The barbers cup, bleed, extract teeth, do arm-to-arm vaccination, and perform circumcision. Massage is done by the bath attendants. Charms are in regular use, and the choice of doctor or treatment is frequently decided by a reference to the Koran or by counting beads. The midwives make internal examinations and introduce strange substances to hasten labour or provoke abortion. The latter practice has become regrettably common in the capital, and is not always the work of uneducated women.

Apart from the regulations about diplomas there are no laws governing the practice of medicine, except one to the effect that the component drugs of a prescription must all be clearly indicated. Post-mortem examinations, like dissection, are contrary to the religious law.

The Opium Question.

The opium question has become one of the most difficult of the many problems which the Nations in Council are striving to solve. For a producer country like Persia, with impoverished finances and many thousands of addicts, it is impossible to exaggerate the importance of the fact that international efforts are being made to limit the cultivation and the abuse of opium. Only a short résumé of this complicated question can be given in a paper on matters of public health, and it should deal chiefly with its medical side and with the problem of the abuse of opium and of its limitation, as it affects Persians. Economic questions are, however, so inextricably bound up with both these aspects that it will be impossible not to mention them.

Abuse of Opium in Persia.

It is difficult to say when opium was introduced into Persia, and when its use for other than medical purposes started. Since, however, it is believed that the poppy plant reached China from Arabia (the Chinese word for opium is a corruption of the Arabic *afiyun*), it does not seem necessary to look further than Persia's neighbour. Moreover, the famous Persian physician, Abu Ali Sina (Avicenna), who lived in the tenth century, when writing of the use of opium, warned his readers against its abuse. There can be no doubt, then, that both have been known for at least some thousand years. Opium smoking is, however, of comparatively recent origin; it was introduced from India into East Persia rather more than 100 years ago, and there are parts of the country where the habit was not known as recently as the end of last century.

To-day the devotees of opium in Persia may be numbered by hundreds of thousands in all ranks of society. It is impossible to give even approximately exact figures, but in 1914 the Municipality of Tehran estimated the number of smokers alone in the city as 25,000. At present some 80 lb. of prepared opium are liberated every day in Tehran (not all for use locally), and probably an equivalent amount is put into circulation fraudulently. The proportion of one

smoker in ten of the population is almost certainly an overestimate for the capital, but in the case of some towns in, say, the province of Khorassan, it would as certainly be found to be much higher.

The users of opium may be divided up into the following groups :—

The Eaters.—1. Those who take a small quantity (¼–1 gr.) once or twice a day. The drug is used as a sedative tonic just as tobacco is used. 2. Those who take opium for its well-known effects. The allowance may reach three, four, or more drachms a day.

The Smokers, the larger of the two groups, comprise: (1) Occasional smokers of prepared opium. (2) Regular smokers of prepared opium, by far the most numerous class. Two drachms is an average quantity. (3) Smokers of *shireh*, a mixture of prepared opium and the burnt residue left in the opium pipe. In parts of Persia the *shireh* smokers are more numerous than the smokers of prepared opium; they are physical and moral wrecks. (4) Smokers of *negari*, a mixture of the burnt residues of opium and of *shireh*. Inconsiderable in numbers. The wide-bored stem of the *negari* pipe, thoroughly well incrusted with the burnt residue after use by generations of smokers, is said to be without price, and to produce its effect by simply drawing air through it! Good prepared opium contains 10–12 per cent. of morphine, *shireh* containing 16 per cent.

While making all allowance for the ingestion of opium in "tonic" doses for the moderate smokers, and for the fact that, in a country where doctors are few and far between, opium is a great solace to people in pain or attacked by malaria, there can be no doubt that the opium habit is doing much harm. It is, moreover, increasing. These statements are not merely the result of personal observation; they represent the considered opinions of Persians competent to judge, and they lead up to the question of the limitation of the abuse of opium. Here it is necessary to give some facts from the economic side of the Opium Question in Persia.

Production and Restriction of Opium.

Roughly 870 tons of opium sap were produced in the year 1923–24. Of these 290 tons were exported, chiefly to the Far East. If allowance be made for under-valuation and smuggling, opium represents 20–25 per cent. of the total value of Persia's exports, not including oil.

The good quality of Persian opium, the demand for opium and morphine in the Far East, and the high prices obtained, have led to a great increase in opium poppy cultivation in recent years. No doubt, too, the prospect of international legislation being enacted to lessen the opium evil prompts cultivators to make hay while the sun shines. By law the whole of the opium sap should enter the Government warehouses. The question of Government control is a difficult one in a country as large as Persia, with a scattered population and difficult communications, and especially in the case of a crop so easily grown as opium; but it is slowly though steadily being improved. The opium sap for use in the country is worked up into sticks (a process in which it loses about one-third of its weight), a *banderole* is attached, and the merchant on regaining possession pays the Government tax. Customs duty has to be paid on the opium cake for export. The total opium revenues for 1923–24 amounted to 8 per cent. of the total revenues of the country. The opium trade employs many thousands of people. In the town of Isfahan it is estimated that at least 25 per cent. of the population lives by opium. The annual average return to landowners and peasants on the opium crop is about £2,100,000 at par. Transport is difficult and costly in Persia, but opium, on account of its small bulk and high value, presents no difficulties. It always fetches ready money—in fact, it takes the place of money. The crop is easily raised and taken and it requires water only at the season when water is plentiful.

These few briefly stated facts show how difficult the problem of restriction of the cultivation and abuse of opium is in the case of Persia. The abuse of opium is recognised by Persians in all classes of society as a national calamity. Their Government has stated, through its representative in the recently held Opium Conferences, its readiness to coöperate in the effort to reduce the evil both at home and abroad. It has introduced or proposed legislation of its own initiative which is directed to that end, and has expressed its willingness to go farther. The Sanitary Council has been instructed to make recommendations for the control of opium-smoking and of the sale of opium, cocaine, and their derivatives. The Governor of Bujnurd, in 1923, took the remarkable step of forbidding opium poppy cultivation in his district. On the other hand, Persia has entered on a period of intense desire to develop her resources; her revenues are not sufficient to meet her needs, and any diminution in the volume of her opium trade would mean serious losses. The solution, already put forward officially, probably lies in the gradual replacement of the cultivation of opium by other crops or trades. There are, however, great difficulties in the way—financial, economical, and physical.

The complexity of the question of suppressing the use of opium in the East is great, and, in the latter end, one is left asking what will be the result if it be achieved. Certainly in the case of Persia, where the use of opium residue as opposed to prepared opium is comparatively limited, to see opium replaced by morphine, cocaine, or alcohol would not be an upward step.

Hashish, Morphine, and Cocaine.

It is difficult to learn the extent of the abuse of hashish. Addicts are numerous in Khorassan and among the dervish fraternity. The drug is smoked in different ways and may also be ingested. There is no Government control, but it is intended to pass laws forbidding the cultivation of the plant and its use. Hashish and opium are occasionally smoked together (*Ruh' ul ajaneh:* the soul of Satan).

In spite of the fact that the Governor of Nishapur reported in 1914 that morphine was being used extensively by injection no further evidence of the practice has been received. The authorities confiscated some parcels of syringes at about the same time. As long as opium for smoking is to be had easily, it is unlikely that the syringe will oust the pipe with its elaborate ritual and the atmosphere of sociability which it creates. It is reasonable to suppose, however, that increasing interference with the liberty of the subject in the matter of opium might lead to the abuse of so easily smuggled a drug as morphine.

The question of narcotic drugs has been examined by the Persian Government since 1911. In 1916 the Ministry of the Interior consulted the Sanitary Council about regulations for the sale of morphine. In 1920 the Ministry of Foreign Affairs reported a great increase in the quantity of cocaine imported and asked the Council to fix the requirements of doctors. As a result in 1922 the Council was charged with the issue of permits for the importation of opium derivatives and cocaine and its similars. The amount of morphine which any one chemist or merchant might import at a time was fixed at 20 g. All parcels were to be sent to the Council's offices for control and distribution, a cumbrous system which has caused trouble with importers living near the frontiers.

Cases of cocaine addiction have not been seen even in the capital except in one or two Persians who have learned its use in Europe.

Alcohol.

Theoretically there should be no need for a paragraph with this heading in a report on a Mussulman country; but the land of Saadi, Hafiz, and Omar Khyam has always been famous for its wine, and in modern times native alcohol (*arak*) has been extensively made. There is, however, no alcohol problem at all comparable with that found in countries further west. Be that as it may, it is interesting to note that in 1921 the revolutionary cabinet of Said Zia ed Din made a courageous attempt to introduce prohibition, and the revolutionary programme was announced at a State banquet at which water, fermented milk, and fruit syrups were the liquid refreshments. It was a difficult policy to carry through on account of the stocks of wine in existence and of the large number of persons who gained their living by wine and *arak* making. In the same year Persia was represented at the International Conference on Alcohol held at Geneva. In 1922 the Ministry of Finance proposed regulations for restricting the import of alcohol by foreigners, and the Sanitary Council recommended that its use should be limited to medical and industrial purposes. At present there are no restrictions on the import of foreign wines and spirits, or the making of wine, although there is a small tax on each load of grapes for use therein. *Arak*, which is made from raisins, is submitted to a heavy tax, which is foregone in the case of alcohol for medical and pharmaceutical purposes. The distilleries in Tehran have been centralised for purposes of control. It is to be noted that the existence of considerable European, Parsi, Armenian, and Jewish communities makes the manufacture and sale of wine and *arak* an easy matter.

The League of Nations and the Sanitary Situation.

As a result of the appeal, to which reference was made in an early paragraph, the League of Nations, in July, 1924, sent out Dr. John Gilmour to report on the sanitary situation. He spent several months in the country, and his preliminary report has reached the Persian Government. An interesting recommendation which it contains is that selected Persian doctors should be sent to Europe for instruction in hygiene, under the supervision of the Sanitary Section of the League.[1]

A society, called the Society of the Red Lion and Sun, was formed in 1923 to carry out humanitarian work comparable to that done by the Red Cross, Red Crescent (Turkey), and Red Sun (Japan) Societies. It has been officially recognised by the International Organisation of Red Cross Societies.

[1] League of Nations Health Organisation. Report on Sanitary Conditions in Persia. Obtainable from Constable and Co., Orange-street, London, W.C. 2.

Innovations.

Before concluding, two interesting changes that have taken place in Persia of recent years, but of a less obviously medical nature than those recounted above, will be described. One is the increasing use of the potato, which, if continued, will provide the country with a valuable addition to, or substitute for, the usual diet of bread or rice. The other is the introduction of field games. Polo and Association football have been played in Persia by Englishmen for many years. Polo, originally a Persian game, has now become very popular among the officers of the army and tournaments are held. Football has within the last four years made great progress, and in the capital regular competitions are held for clubs and for schools. The terms used are the English ones, and the keenness is intense. In the autumn of 1924 an elaborate athletic meeting was held in Tehran. Bicycling has also become very popular.

All who have come in contact with young Persians will realise what an enormous effect for good the introduction of active sports will have on their health and morale. It is for this reason that the subject is worthy of notice as of real importance to the public health of the country.

Conclusion.

A review of public health questions in Persia during the past 11 years shows that the most important problem is presented by malaria, and that so far no prophylactic measures on a large scale have been attempted.

As regards the great epidemic diseases certain towns on the southern sea-board in communication with India, the Arabian coast of the Persian Gulf, and Mesopotamia, are liable to limited outbreaks of plague, but the country as a whole presents natural obstacles to the spread of that disease. None of the plague centres described in the past have shown signs of activity, and no new centres have appeared. Cholera, on the other hand, once introduced has been difficult to arrest, but again is not endemic. An imported case of cholera at Abadan gave rise to a local epidemic in 1924 which spread to Mesopotamia. This is the only instance, during the period under review, of an epidemic originating in Persian territory and spreading to a neighbouring country. Variola and typhus fever are endemic, and an extensive epidemic of the latter occurred in 1917–18 after a year of drought and famine. Relapsing fever became epidemic at the same time, and, as an occasional sporadic case is seen at long intervals, must be counted endemic.

Progress in sanitation has been made in the capital, and a public vaccination service for the greater part of the country, and now in its fourteenth year, has met with considerable success. The local preparation of vaccine lymph is a big step in advance.

Epizootic diseases have become a serious problem. Anthrax has long been known to exist and now the occurrence of cattle plague has been proved.

The abuse of opium has become very serious from the point of view of health.

Field games have been successfully introduced.

The public health is in the hands of young Persians with Western training, but no special qualifications for this kind of work. Their plans for an organised health service are praiseworthy, but are hampered by lack of funds and, above all, of properly trained medical officers. The quarantine service in the Persian Gulf is, however, well staffed and organised.

The Persian Government has uniformly done its best to give effect to the proposals made to it by its advisers and has fulfilled its international obligations. The population and the health services are, however, suffering from the failure to make radical changes in the organisation of the State Medical School and to make the teaching more practical and more modern.

FRENCH DOCTORS AND THE FALLING FRANC.

THERE used to be an old saying that the only way to grow rich was to pay one's debts. This is true in the sense that no man is really rich so long as others have rights over his property. A writer in *Paris Médical* [1] now points out that this saying is, alas, no longer true in France. He who pays his debts in Paris to-day grows poorer, not richer. The man who paid his tailor's bill in September would have done better to put off paying it till December, when the rate of exchange and the corresponding value of the franc had fallen. This curious and unfortunate state of affairs has placed French doctors in an embarrassing situation. Formerly in reference to a code of elegant manners, it was not considered proper for a doctor to send in his bill before a decent period had elapsed after the consultation. Certain families, arbiters of punctilio, were outraged if he dared to present his account before three, four, or even five years had gone by. The price of politesse in those days, however, merely amounted to a few francs' interest lost, and that, we may suppose, was more than made up in increased prestige. But now the situation has completely changed. In little more than a year the £ has risen from 80 to 130 francs—that is, the franc has lost almost half its value. A doctor who, in January, 1925, might have bought himself a new suit with a patient's fee paid on the spot, could hardly buy himself a dinner with that same fee paid in January, 1926. Doctors are bad accountants, and it has taken some time for them to realise the situation. For months past their housekeepers have been asking for more and more money to pay for lettuces and cauliflowers, and they have grumbled a little at the high prices, but they have hardly given serious thought to what these rising prices really meant. Now things have reached such a pass that they are forced to face the situation. Doctors have stomachs, like their patients, and stomachs have certain definite functions to perform. Many French medical stomachs, accustomed to burgundy, have perforce now to be content with vin ordinaire. The only practical solution of this economic crisis, thinks the French writer, is to follow the example of many surgeons and specialists, and to ask boldly for payment of fees on the spot. This seems a sensible solution of the problem, and some doctors on this side of the Channel might be grateful if their French colleagues set the fashion of cash, not credit.

[1] No. 4, 23 Janvier, 1926, p. 78.

THE TOILET OF THE MOUTH.

WE have received from Mr. E. M. Uneé, of 30, Swan-road, Harrogate, three articles for use in the toilet of the mouth which deserve trial. The first is a tooth-brush designed to clean the front and back surfaces of the teeth at the same operation and consists of two tooth-brushes with the face of the bristles opposed to each other, the handles being joined together with a U-shaped spring. Pressure put upon the spring regulates the distance between the two surfaces of the brushes between which the teeth pass as the brush is moved backwards and forwards or up and down. The second is an instrument for cleaning and massaging the gums, and consists of two small soft rubber rollers mounted on wire handles. The handles are so shaped that the rubber rollers can be made to press on the gums at any point as well as upon the roof of the mouth. The third article is a saline tooth-powder for employment with either the massage instrument or with the tooth-brushes, and is pleasant in use. The registered trade name of all three articles is "Gummette."

NEW INFECTIOUS HOSPITAL FOR HULL.

THE Health Committee of Hull Corporation has approved plans for a new infectious hospital at Cottingham, which will cost £85,000. The medical officer states that Hull compares unfavourably with other large towns in regard to accommodation for infectious diseases. The number of beds normally provided at the City Hospital is 116, but there were recently 133, while the cubic feet per bed specified by the Ministry of Health would permit of only 56.

WESTMINSTER HOSPITAL.

To the Editor of THE LANCET.

SIR,—I notice that in your issue of March 20th you state that the out-patient attendances at Westminster Hospital are 3·5 per cent. more than in 1922. This should read 35 per cent.; the correction makes the substantial increase in our out-patient work apparent. Your statement that subscriptions have increased by 58 per cent. and donations by nearly 100 per cent. may, perhaps, give a misleading impression of the financial position of the hospital. This statement was a quotation from the report made by Mr. E. H. Hoare, our treasurer, at the meeting of the quarterly board, and he went on to say that, although the public were showing their appreciation of our great work by increased support, yet that support was still quite inadequate to the greater needs of the hospital, as was evidenced by the fact that in 1925 there was a deficit of £2649.

I am, Sir, yours faithfully,

CHARLES M. POWER.
Secretary.

March 24th, 1926.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, April 8th.—4 P.M., Dr. Cockayne: Bronchiectasis.

ANCOATS HOSPITAL POST-GRADUATE LECTURES.
THURSDAY, April 8th.—4.15 P.M., Dr. Langley: Diabetes in General Practice.

MANCHESTER AND SALFORD HOSPITAL FOR SKIN DISEASES POST-GRADUATE COURSE, Quay-street.
THURSDAY, April 8th.—4.30 P.M., Dr. Lancashire: Pus Coccal Infections of the Skin.